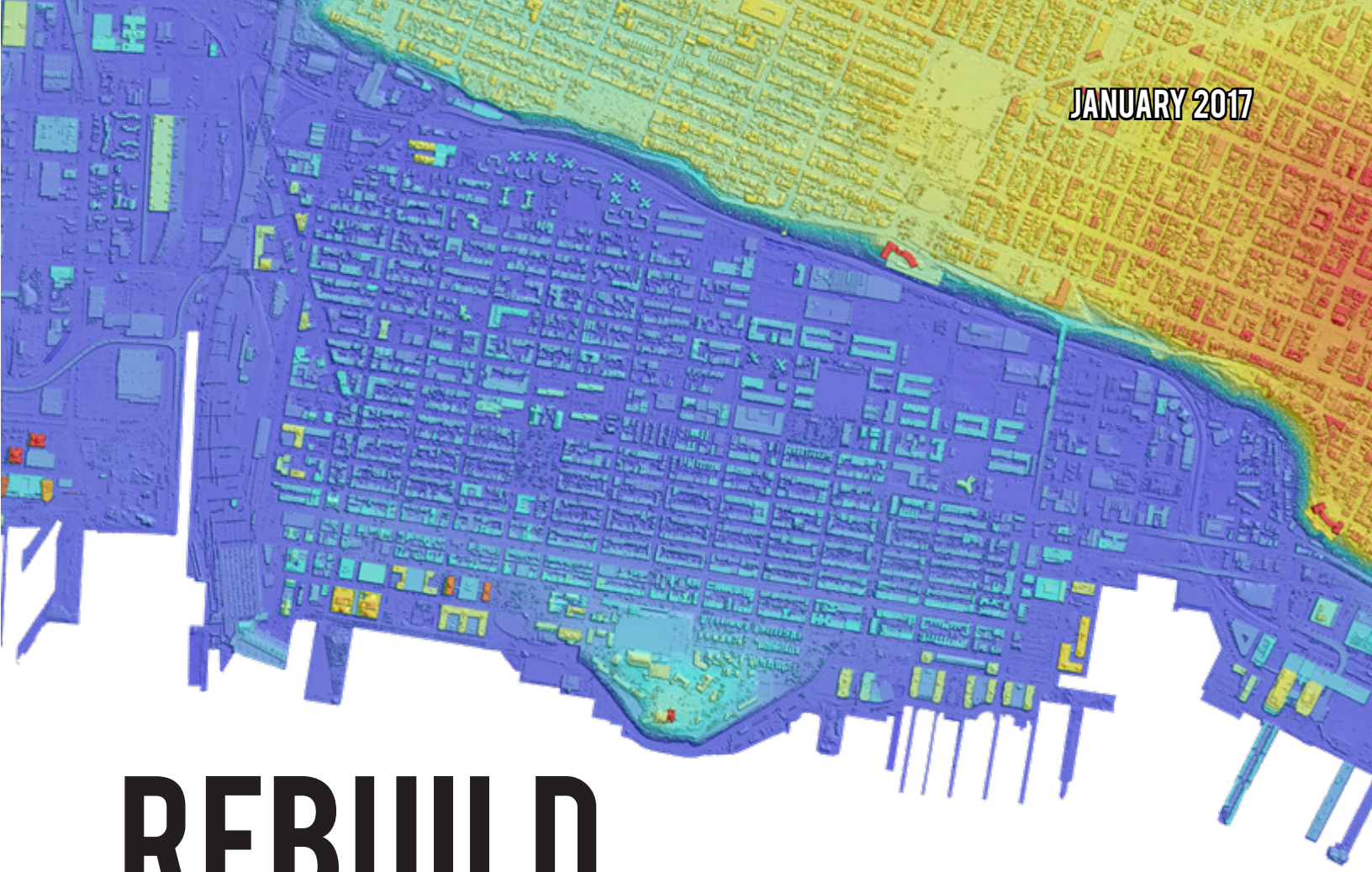

JANUARY 2017

REBUILD BY DESIGN

▪ RESIST ▪ DELAY ▪ STORE ▪ DISCHARGE ▪

HUDSON RIVER

Hoboken | Weehawken | Jersey City | New Jersey

AIR QUALITY
TECHNICAL ENVIRONMENTAL STUDY

Air Quality
Technical Environmental Study

Rebuild By Design: Resist, Delay, Store, Discharge Project
Cities of Hoboken, Weehawken, and Jersey City
Hudson County, New Jersey

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1.0 INTRODUCTION

In order to address the need for flood risk reduction within the Superstorm Sandy-affected region, the United States Department of Housing and Urban Development (HUD) launched the Rebuild by Design (RBD) competition in 2013 inviting communities to craft pioneering resiliency solutions. During the course of this competition, a comprehensive urban storm water management strategy was developed for the Hoboken, Jersey City and Weehawken area that included hard infrastructure and soft landscape for coastal defense (Resist), policy recommendations, guidelines and urban infrastructure to slow storm water runoff (Delay), green and grey infrastructure improvements to allow for greater storage of excess rainwater (Store), and water pumps and alternative routes to support drainage (Discharge). This proposal was selected as a winner of the RBD competition, and HUD subsequently awarded the State of New Jersey $230 million for the implementation of the first phase of the "Hudson River Project: Resist, Delay, Store, Discharge" (the Project).

This Air Quality Technical Environmental Study (TES) was prepared by Dewberry Engineers Inc. (Dewberry), on behalf of the New Jersey Department of Environmental Protection (NJDEP), to evaluate the flood reduction improvements proposed for the RBD project. A summary of this TES will be provided in the Environmental Impact Statement (EIS) for the Project.

1.1 Project Location and Topography

The Project's Study Area encompasses the City of Hoboken and includes the southern portion of the Township of Weehawken and the northern portion of Jersey City. The Study Area has the following approximate boundaries: the portion of the Hudson River which encompasses piers within the Study Area to the east; Baldwin Avenue (in Weehawken) to the north; the Palisades to the west; and 18th Street, Washington Boulevard and 14th Street (in Jersey City) to the south. See Figures 1 and 2, Project Location and Study Area. The Study Area includes the entire comprehensive stormwater management approach which consists of the four components—Resist, Store, Delay and Discharge.

The Study Area is located along the banks of the Hudson River, beneath the Palisades, which rise to the west. Formerly an industrial waterfront community, over the past several decades the Study Area has become increasingly developed with multi-family residential and mid- and high-rise commercial development. Unobstructed views of Manhattan across the Hudson River have led much of this development to be located along the waterfront, but areas in the north and central interior portions of the Study Area have also seen an influx in residential development over the past decade.

The upland area within the Study Area is the land area above mean high tide, and is approximately 1,020 acres. The Study Area encompasses approximately 233 acres of the Hudson River. Figure 3 shows the Preliminary Flood Insurance Rate Map (FIRM) for the Study Area. The Base Flood Elevation (BFE) is the computed elevation to which floodwater is anticipated to rise during a one-percent chance annual flood. This area is also known as the 100-year

floodplain. The BFE is the regulatory requirement for the elevation or flood proofing of structures. The relationship between the BFE and a structure's elevation determines the flood insurance premium. Approximately 73 percent, or 16,800 parcels of land, within the Study Area are within the Hudson River's one-percent annual-chance floodplain (Zone AE/VE). The AE and VE zones are both 1% annual-chance floodplains, but the VE zone, which is usually along coastlines and typically does not extend beyond the waterfront (the streets, parks and esplanade directly bordering the Hudson River), is also subject to storm-induced velocity wave actions. About 4% of the land within the Study Area is within the VE zone and has base flood elevations (BFEs) of between 16 and 17 feet North American Vertical Datum (NAVD) 88 (the base flood elevation is the anticipated water level during a flood event). The majority of the Study Area (69%) is within the AE flood zone, with BFEs of between 10 and 12 feet NAVD 88. Within this area, there is a 1 percent probability of flooding in any given year. The area depicted in Figure 3 as having a 0.2 percent annual chance of flooding is also known as the 500-year floodplain. The area depicted in white on Figure 3 has an elevation higher than the estimated 500-year flood level.

Within the Study Area, there are two main entry points of floodwater during coastal storm surge events, such as Superstorm Sandy, the area around Long Slip Canal and Hoboken Terminal, and Weehawken Cove (see Figure 4). Flood waters enter at these points because they are the lowest areas of topography. Following a storm event, low-lying topography prevents water from receding. For reference, Figure 4 also displays the ground surface elevation in 5 foot contour intervals.

The topography of the Study Area is highest along the east-central portion abutting the coastline of the Hudson River at Castle Point. From here, the land slopes gently downward to the north (towards Weehawken Cove), south (towards the Hoboken Terminal and Jersey City) and to the west (towards the foot of the Palisades). This topography reflects the Study Area's history; when originally settled, Castle Point was an island surrounded to the north, south and west by wetlands. These wetlands were gradually filled in as the area grew. Today, these areas - in particular those to the west - are still extremely low-lying, in some places no more than three feet above mean sea level.

1.2 Project Background

The municipalities of Hoboken, Weehawken, and Jersey City were inundated by flood waters during Superstorm Sandy in October 2012. With half of Hoboken flooded for several days, most emergency services were unavailable, many residents were evacuated, and the National Guard was deployed to rescue those who could not evacuate. The magnitude of Superstorm Sandy's devastation, primarily attributed to a record-breaking storm surge during high tide, has overshadowed the fact that little precipitation fell during that storm. Had Superstorm Sandy been accompanied by a more typical heavy rainfall event, the Study Area's past history suggests that flooding levels and property damage could have been even higher.

The Study Area is vulnerable to two interconnected types of flooding: coastal flooding (both from storm surges as well as high tides) and systemic inland flooding (rainfall) which occurs during rainfall events that typically coincide with high tide. These flooding problems are attributed to several factors, including naturally low topography and

proximity to waterways; impervious surface coverage and associated runoff; existing, relatively old, sewer infrastructure with interconnected storm and sanitary sewer lines and insufficient discharge capability particularly during high tide.

As seen with Superstorm Sandy, coastal flooding can devastate widespread areas of the Study Area and cause significant economic damage and safety concerns. In addition, systemic inland flooding associated with rainfall tends to be more localized to inland areas of lower elevation, but happens with much greater frequency than coastal surges. The systemic inland flooding typically occurs when high volumes of water are brought into the combined storm-sewer system from rainfall events which coincide with an approaching high tide and/or storm surge. During a high tide or storm surge, the water level of the Hudson River can rise above the level of the combined storm-sewer outfalls; as a result, the river traps the water inside the combined storm-sewer system. Water then backs up within the system, flooding low-lying elevation inland areas with storm water and at times sanitary sewage.

1.2.1 Coastal Flooding

The coastal communities of Hudson County historically have been vulnerable to coastal flood events. This can be in the form of abnormally high tides that occur roughly twice a month (coinciding with full or new moons), or from storm surges brought on by coastal storms. According to FEMA's Preliminary Flood Insurance Study of Hudson County, New Jersey (FEMA, 2013), the most severe flooding for the coastal communities of Hudson County occurs from coastal storm surges during hurricanes. Coastal storm surge water is brought into the area from the Upper New York Bay, New York Bay and the Kill Van Kull, where it is then driven by winds upriver along the Hackensack, Passaic and Hudson Rivers, eventually overflowing onto the shoreline communities. The duration of coastal surges can be increased if the storm also brings about high amounts of rainfall. For example, in 2011, Hurricane Irene brought a five-foot storm surge to the Hudson River, flooding parts of Jersey City and Hoboken, along with 10 inches of rainfall. After the storm passed, flooding conditions remained because the vast amount of rainfall from the storm was draining through tributaries to the Hudson River, which was already swollen by the storm surge.

The coastal surge can be further exacerbated if it coincides with a high tide. For example, a strong storm surge on the Hackensack River on November 25, 1950 resulted in flood waters of 6.5 feet (nine feet above the low-tide level). If this coastal storm surge had occurred during high tide, flood levels would have reached 12 feet. A situation like this occurred during Superstorm Sandy; the storm surge coincided with a full moon, which caused an abnormally high tide. This factor significantly contributed to Superstorm Sandy's devastating flooding of the Study Area.

Superstorm Sandy exposed the vulnerabilities within the Study Area by flooding the coastal areas of Jersey City, Weehawken and Hoboken, as well as over two thirds of the City of Hoboken's low-lying elevation interior areas. Coastal storm surge waters flooded electric utility substations and transformers; power was not restored to many Jersey City and Hoboken residents for nearly two weeks. In addition, the storm surge flooded critical transportation infrastructure, including the Port Authority Trans Hudson (PATH) line at the Hoboken Terminal. Service on this line was not restored for several months, impacting 10,000-15,000 commuters on a daily basis

Studies conducted by the Stevens Institute of Technology Davidson Laboratory (Davidson Laboratory Technical Report TR-2933, October 2014) found that approximately 466 million gallons of water inundated the interior areas of Hoboken. The water entered at the lowest areas of elevation. Within the Study Area, there were two main entry points: the area around Long Slip Canal and Hoboken Terminal in the south of Hoboken, and Weehawken Cove in the north. In the south, the surface elevation ranges between two and five feet above sea level in and around Warrington Plaza and the Hoboken Terminal. Superstorm Sandy brought approximately 11 feet of coastal storm surge water into Warrington Plaza and Hoboken Terminal, resulting in flood waters of between six to nine feet above ground elevation In the area around Weehawken Cove, the elevations range between six and seven feet above sea level. When these elevations are compared to the storm surge levels caused by Superstorm Sandy, the degree of flooding becomes apparent.

The southern and northern low-lying elevation areas of the Study Area, along the Hudson River, acted as an inlet for flood waters into western Hoboken (see Figure 4). During Superstorm Sandy, according to the Stevens Study, approximately 232 million gallons of water entered at the southern breach point, to the south of the Hoboken Terminal. Approximately 78 million gallons of this water remained within the NJ Transit rail yard, the balance of the water (154 million gallons) entered the western portion of the Study Area. Of the portion that entered from the south, 98 million gallons flowed across the rail yard before entering Hoboken along Observer Highway at Park and Willow Avenues, and 56 million gallons moved through Long Slip Canal towards Marin Boulevard. Some water passed from southwest Hoboken into Jersey City via Marin Boulevard, Grove Street and Jersey Avenue, which run beneath the Hudson Bergen Light Rail and NJ Transit rail crossings. In addition, 191 million gallons of coastal storm surge water entered through northern Hoboken, in and around Weehawken Cove. This water flowed to the west into Weehawken, and then south, into the H7, H5, and ultimately H1 sewersheds, respectively (for reference of the combined sewer system, please see Figure 5).

The ground elevation in western Hoboken is low-lying; the H1 sewershed (the southwestern area of Hoboken; see Figure 5) in particular is on average about three feet above sea level. Floodwaters were funneled in from the north and south, inundating this portion of Hoboken, as well as the western areas of the H4, H5 and H7 sewersheds. Because the coastal storm surge prevented outflow from the combined storm-sewer system (the surge water elevation was above the outflow level), the surge waters had nowhere to flow and persistent inland flooding resulted. Ultimately, the outflows were underwater and the combined storm-sewer system was unable to discharge. In addition, because the storm surge prevented sewer outflow, domestic sanitary sewage backed up in residences and businesses, posing a public health risk. Overall, Superstorm Sandy caused approximately $100 million in damages to private property and $10 million in damages to City-owned property in Hoboken. Notably, Hoboken University Medical Center (the only hospital within the Study Area, located in south-central Hoboken) suffered significant flood damage; the hospital was forced to evacuate all patients the day prior to the storm, and was not able to fully reopen until November 14, over two weeks after the storm hit. In the interim, patients were redirected to other nearby hospitals - many of which were also damaged by Superstorm Sandy.

Sea-level rise and high tides also represent distinct coastal flooding concerns. The National Oceanic and Atmospheric Administration (NOAA) estimates sea levels may rise from between 0.5 to 3.5 feet by the year 2075. Based on these projections of sea level rise, the associated base flood elevations along the Study Area's coastline will likewise increase, further compounding the risk of flooding. High tides will increasingly overtop the existing bulkheads, particularly during storm surges, thereby inundating the low-lying areas of the community with much greater frequency. Studies have shown that in the mid-1800s, there was a 1 percent annual chance of a bulkhead being overtopped by a storm surge within the New York Harbor area; today there is a 20 to 25 percent annual chance of bulkhead overtopping (Blumberg et al, 2015). Rising sea level also means that the North Hudson Sewerage Authority (NHSA) outfalls and other critical infrastructure will be closer to mean sea level, and will be inundated more frequently during high tides. As the vertical distance between the elevation of the water and the elevation of the outfalls decreases, less intense storm surge (which happen with greater frequency than stronger storms) will have the ability to inundate the outfalls, thereby reducing the ability of the system to properly drain storm waters. This means that over time, coastal flood events are expected to occur with greater frequency, which will increase the urgency for flood risk reduction measures.

1.2.2 Systemic Inland Flooding

The NHSA, which provides storm and sanitary sewer utility service to the Study Area, has a combined sewer system that was built in two periods, during the 1850s, and from the 1920s to the 1940s. The combined sewer system handles both sanitary sewerage and storm water runoff. Hoboken is divided into seven main drainage areas (H1-H7, see Figure 5). Sewerage is conveyed through the system by gravity from its source (e.g., a residence or business) through combined sewer mains beneath street beds to the system's main interceptor pipelines. During dry conditions, a system of pump stations located within the NHSA's service area pumps the sewerage to the NHSA's Adam's Street Wastewater Treatment Plant (WWTP). This WWTP serves Hoboken, Weehawken and Union City. During rainstorms, storm water (i.e., rainfall runoff) flows into the combined sewer mains via street and curb inlets, and combines with the sanitary sewerage. If the combined sewer-flow volume exceeds the treatment volume capacity (between 32 and 36 million gallons per day) of the WWTP, a portion of the combined sewer overflow volume is pumped into the Hudson River through the various outfalls located along Hoboken's waterfront.

Inland flooding occurs when the combined sewer system is unable to outflow excess water into the Hudson River. This typically occurs when high volumes of water are brought into the combined sewer system during a high tide and/or storm surge and the outfalls are closed and are unable to discharge. Rainfall events of greater than two inches, combined with a high tide of four feet or greater, occurred 26 times in Hoboken from 2002 to 2012. This is expected to increase in frequency over time based on projections of sea levels rising. As a result, high tides and storm surges are expected to block or obstruct the outfalls for increasingly longer periods of time.

Potential flooding can be further exacerbated if rainfall occurs during high tide and during the daytime hours, when sanitary flows are highest. During a high tide or storm surge, the water level of the Hudson River can rise above the level of the combined sewer outfalls; as a result, the river traps the water inside the combined sewer system. Raw

sewage and storm water then backs up through curb inlets and domestic interior plumbing, and floods streets as well as basements of homes and businesses. After flood waters recede, sewage residue (as well as residues from diesel, gasoline and other common roadside chemicals and contaminants) coats roadways, sidewalks, homes and businesses, representing a public health risk, and necessitating cleanup subsequent to the storms.

The most significant inland flooding typically occurs in the H1 sewershed (see Figure 5). A sewershed is a division of a drainage area that is managed by a stormwater utility. The H1 sewershed is located in the southwest area of Hoboken and is bounded generally by Observer Highway to the south, Clinton Street to the east, 7th Street to the north and the NJ Transit Hudson-Bergen Light Rail to the west. This sewershed is extremely low-lying, generally less than three feet above sea level. The most frequent flooding in this sewershed occurs typically around Patterson Avenue and 1st Street (in the vicinity of the 2nd Street Light Rail Station) and Jackson Street and 4th Street. This part of the Study Area is also home to several of the Hoboken Housing Authority's communities, including the Andrew Jackson Gardens and the Monroe Gardens senior housing center, whose residents (i.e., low income and/or elderly) are particularly vulnerable to the impacts from flooding.

The NHSA installed a 50-million gallon-per-day (MGD) wet-weather pump for the H1 sewershed in 2012; however, analysis in 2013 by EmNet indicated that flooding still occurs in severe storms. The pump was activated 36 times between December 2012 and August 2013; of these activations, four storm events led to flooding. In addition to the H1 sewershed, the western areas of sewersheds H4 and H5 (just to the north of H1) also experience significant flooding, notably along 9th Street between Monroe Street and Madison Street.

The Study Area's flooding is greatly exacerbated by its high degree of impervious surface coverage: the Study Area is approximately 94 percent impervious, from building footprints or paved areas such as streets, sidewalks and parking lots. This is a product of the area's population density; with a population per square mile of 39,066, Hoboken is the nation's fourth densest municipality. The area's high impervious cover means that almost all the rainfall that reaches the ground is funneled rapidly into the combined sewer system through building downspouts and street-level storm drains, instead of being discharged onto permeable ground for gradual infiltration, as would be the case in areas with lower impervious coverage. This, coupled with the inability of the system to discharge during a high tide or storm surge, results in inundation of the combined sewer system during a rainfall event and backing up of the sewer system. Ultimately, this leads to the flooding events in low-lying areas, resulting in damage to buildings, residences, cars and infrastructure.

These various factors all contribute to the need to develop a comprehensive flood risk reduction strategy to safeguard against damage to people, property and infrastructure.

1.3 Project Authorization and Regulatory Framework

This Project is funded by HUD Community Development Block Grant - Disaster Relief (CDBG-DR) funds and compliance with a full range of federal, state and local environmental laws is required, as provided in FR notice 79

FR 62182, published October 16, 2014 [Docket No. FR-5696-N-11]. The Project's compliance with all applicable environmental laws and authorities as stated in HUD regulations (24 CFR 58.5 and 58.6), will be demonstrated.

In accordance with 24 CFR 58.1(b)(1), the State of New Jersey, acting through the New Jersey Department of Community Affairs (NJDCA), has assumed environmental compliance responsibilities for the Superstorm Sandy CDBG-DR programs on behalf of HUD. The NJDCA has designated the New Jersey Department of Environmental Protection (NJDEP) to assist with the environmental review. The NJDEP has prepared this DEIS in accordance with HUD's procedures for NEPA found at 24 CFR Part 58, et al. An NOI to prepare the EIS (as defined at 40 CFR 1508.22) was published on September 4, 2015. Simultaneously, the Draft Scoping Document was made available for a 30-day public comment period, and a public meeting was held to discuss scoping on September 24, 2015, followed by drop-in sessions open to the public on September 29 and October 1, 2015. The Final Scoping Document was published on the Project website (http://www.nj.gov/dep/floodhazard/rbd-hudsonriver.htm) in November 2015.

This DEIS is being made available to the general public for comment, as well as circulated to stakeholders, organizations and government agencies that have jurisdiction by law or special expertise with respect to the proposed action. Six agencies/organizations have been identified as being cooperating agencies. The cooperating agencies are:

1. National Marine Fisheries Service (NMFS)
2. Amtrak
3. NJ Transit
4. Port Authority of New York/New Jersey
5. United States Army Corps. Of Engineers (USACE)
6. Environmental Protection Agency (EPA)

Additionally, Federal Transit Agency (FTA) has been identified as a participating agency.

A Notice of Availability of this DEIS has been published in the Federal Register and local media outlets in accordance with HUD and the Council on Environmental Quality (CEQ) regulations. After a 45-day public comment period has elapsed, public comments will be addressed in a Final EIS (FEIS) The FEIS will be circulated in the same manner as the DEIS (including the publication of a Notice of Availability) and will have a comment period of 30 days. If, after the completion of the FEIS comment period, no additional significant comments are received, the NJDEP will complete a Record of Decision (ROD). The ROD designates the selected action, and provides the basis for its selection. It identifies environmental impacts as well as any required mitigation measures that were developed during the EIS process.

1.4 Funding

The Disaster Relief Appropriations Act of 2013 (Public Law 113-2, approved January 29, 2013) was enacted to assist New Jersey's and other disaster-impacted states' recovery efforts for disasters that occurred between 2011

and 2013, including Superstorm Sandy. It appropriates monies targeted for disaster recovery to various federal agencies. Among those monies, the federal government appropriated $16 billion in CDBG-DR funds to be split among states that experienced natural disasters from 2011 to 2013, which the President declared to be Major Disasters. These CDBG-DR funds are administered by HUD and are to be used to address unmet disaster recovery needs, including funding needs not satisfied by other public or private funding sources like Federal Emergency Management Agency (FEMA) Individual Assistance, Small Business Administration Disaster Loans or private insurance. And, as a precondition to receiving CDBG-DR funds, New Jersey was required to submit a comprehensive Action Plan that detailed its unmet needs and described the proposed uses of CDBG-DR funds to address those needs.

The CDBG-DR Action Plan was developed by the NJDCA and approved on April 29, 2013. The Action Plan proposes a range of programs to provide relief following the extensive devastation caused by the storm to the affected residential/business communities and infrastructure. The Action Plan is updated periodically, and Amendment 12 "Substantial Amendment for the Third Allocation of CDBG-DR Funds" was approved on April 20, 2015. Amendment 12 was prepared pursuant to FR-5696-N-11, in order to access the third round of CDBG-DR funds allocated for the New Jersey RBD projects. Amendment 12 provides details on funding, timeline and citizen participation with regard to the Project. Another amendment to the Action Plan will be required to finalize the allocation of funding towards the Preferred Alternative that will be identified through this NEPA process.

In the Federal Register notice announcing award of this funding (79 Federal Register 62182), HUD provided the following direction, “CDBG-DR funds are provided to assist in the implementation of the first phase (“Phase 1”) of the proposal titled “Resist, Delay, Store, Discharge.” Page 14 of the April 2014 Resist, Delay, Store, Discharge final proposal states that Phase 1 includes: (1) a master plan for the entire strategy, (2) studies and pilot projects on various aspects of the overall strategy and (3) the following catalytic projects: coastal defense at Hoboken Station and surroundings, coastal defense at Weehawken Cove, pump station and greenbelt CSO wetland plot.

2.0 PURPOSE AND NEED

The purpose and need statement for the Project was developed through a comprehensive process that began with the development of the original proposal submitted to HUD for funding, continued through the scoping process and concept and alternative development for the EIS. Key stakeholders, including elected officials, agencies with regulatory authority, community leaders and the general public were involved at each stage.

2.1 Purpose

The Study Area, comprising the entire City of Hoboken, and adjacent areas of Weehawken and Jersey City (see Section 1.1), is vulnerable to flooding from both coastal storm surge and inland rainfall events. The purpose of the Project is to reduce the flood risk to flooding areas within the Study Area. The Project intends to minimize the impacts from surge and rainfall flood events on the community, including adverse impacts to public health, while providing benefits that will enhance the urban condition, recognizing the unique challenges that exist within a highly developed urban area.

2.2 Need

The historic flooding, and the high likelihood of future flood events from both rainfall and coastal surge flooding, has a tremendous impact on the lives of Study Area residents from a health and safety and economic perspective. When critical infrastructure, including fire stations, hospitals, and a waste water treatment plant (Figure 6) is impacted, it affects the welfare of the entire community. The economic livelihood of the community is diminished by the business disruptions caused by flooding and continual costs to repair and restore homes and businesses, with costs often exceeding the average National Flood Insurance claim award. The future potential for flooding is significant based on Hoboken's topography and the need for a project that minimizes flooding is critical to the health and safety and economic vitality of Hoboken and its affected neighbors in Weehawken Cove and Jersey City.

The Study Area is a very dense urban area of Hudson County that is situated along the Hudson River directly west of Manhattan, New York. The Study Area is vulnerable to two interconnected types of flooding: coastal flooding from storm surge and high tide, as well as systemic inland (rainfall) flooding from medium (generally a 5-year, 24-hour) to high (generally over 10-year, 24 hour) rainfall events.

- Coastal flooding happens with much less frequency than rainfall flooding events, but can devastate widespread areas of the Study Area and cause significant economic damage and safety concerns.
- Rainfall-induced flooding occurs with significantly greater frequency than coastal flooding, but causes less severe economic damage and safety concerns.

The flooding problems for both coastal flooding and rainfall-induced flooding can be attributed to several factors, including naturally low topography and proximity to waterways; significant areas impervious ground coverage which

causes surface runoff; existing combined storm sewer infrastructure which cannot handle the volume of water during significant rainfall events and insufficient storm sewer discharge capability, particularly during high tide.

The topography of the Study Area is highest along the east-central portion abutting the coastline of the Hudson River at Castle Point. From here, the land slopes gently downward to the north (towards Weehawken Cove), south (towards the Hoboken Terminal and Jersey City) and to the west (towards the foot of the Palisades). This topography reflects the Study Area's history; when originally settled, Castle Point was an island surrounded to the north, south and west by wetlands. These wetlands were gradually filled in as the area was developed. Today, these areas – in particular those to the west – are still extremely low-lying, in some places no more than three feet above sea level.

The City of Hoboken's exposure to flood hazard risks is evident by the number of properties included in the FEMA National Flood Insurance Program (NFIP). The NFIP is intended to reduce the financial and recurring impact of flooding on private and public structures by providing affordable insurance to property owners and encouraging adoption of floodplain management regulations. Mortgage lenders for properties within the Special Flood Hazard Area (SFHA) (areas with a 1 percent annual chance of flooding, also referred to as the base floodplain or the 100-year floodplain) require owners to obtain flood insurance from the NFIP. In addition, property owners receiving awards following presidentially-declared disasters (such as Superstorm Sandy) are also often required to obtain NFIP insurance. According to NFIP statistics (https://www.fema.gov/policy-claim-statistics-flood-insurance), as of August 31, 2016, the City of Hoboken had 9,446 NFIP policies in place (the highest in Hudson County), with premiums totaling $7,213,754 (the highest in Hudson County and fifth highest in New Jersey). In addition, the overall liability to the NFIP from property owners in Hoboken was over $2 billion (third highest in New Jersey) with an average claim amount of $26,733.

The need for the Project that minimizes the impacts from coastal and rainfall flooding is necessary and essential to protect public health and safety, and the economic vitality of the community of Hoboken and its beneficiary neighbors in Weehawken Cove and Jersey City.

2.3 Goals and Objectives

A Project is intended to create a resilient community that is able to resist and rapidly recover from disasters or other shocks with minimal outside assistance. The Project is a comprehensive urban water strategy whose overall purpose is to reduce flood hazard risks, and which seeks to leverage resiliency investment to enhance the urban condition. The ability to meet this purpose will be measured in terms of Goals and Objectives. Goals (in italics below) are overarching principles that guide decision-making. Goals are measured in terms of Objectives, which are measurable steps to meet the Goal. The Goals and Objectives for the Project are:

- Goal: Contribute to Community Resiliency:
- Objective: The Project will seek to integrate flood hazard risk reduction strategies with emergency, civic, and cultural assets. The Project will reduce flood risks within the Study Area, leading to improved resiliency and the protection of accessibility and on-going operations of services (including protecting physical

infrastructure such as hospitals, fire stations and police department buildings as well as roadways and transit resources). This would allow these key assets to support emergency preparedness and community resiliency during and after flood events.

- Goal: Reduce Risks to Public Health:
- Objective: In addition to providing protection to critical healthcare infrastructure (such as local hospitals and emergency preparedness services), the Project will aim to reduce the adverse health impacts that result from combined sewage backups onto streets, and within businesses and residences, through a reduction in storm water infiltration into the existing combined sewer collection system.

- Goal: Contribute to On-going Community Efforts to Reduce FEMA Flood Insurance Rates:
- Objective: The City of Hoboken's exposure to flood risks has resulted in some of the highest insurance premiums in the state. The City has long had a goal of reducing those rates through a number of comprehensive flood risk reduction programs, such as those identified in the City's Green Infrastructure Plan. The NFIP's Community Rating System (CRS) allows municipalities to reduce their flood insurance rates through implementation of comprehensive floodplain management. The Project will propose concepts and alternatives that are consistent with Hoboken's overall effort of reducing FEMA Flood Insurance Rates.

- Goal: Delivery of Co-Benefits:
- Objective: Where possible, the Project will seek to integrate the flood hazard risk reduction strategy with civic, cultural and recreational values. The Project will look to incorporate active and passive recreational uses, multi-use facilities, and other design elements that integrate the Project into the fabric of the community. In this way, the Project will complement local strategies for future growth.

- Goal: Connectivity to the Waterfront:
- Objective: The Study Area's waterfront is currently the location of a vast length of interconnected parks and public walkways which contribute to the vibrancy of the community. The Project will aim to incorporate features that do not restrict access to the waterfront. Where feasible, the Project will build upon, and enhance, existing waterfront access points while providing flood risk reduction.

- Goal: Activation of Public Space:
- Objective: The Project will develop concepts that reduce risks to private and public property from flood impacts while also incorporating design elements that activate public and recreational spaces, thereby enhancing quality of life for the community.

- Goal: Consider Impacts from Climate Change:
- Objective: The Project will take into account the projected impacts from climate change, particularly as it relates to sea-level rise and its impacts on the frequency and degree of flooding.

3.0 BUILD ALTERNATIVES

NEPA documents must evaluate all reasonable alternatives (40 CFR 1502.14). The alternatives to be considered in any NEPA document are driven by the purpose and need for the action. The purpose and need for the Project is to reduce the potential for and magnitude of flooding impacts arising from both coastal storm surge and rainfall events (see Chapter 2.0 Purpose and Need). The success of constructing a reliable and permanent comprehensive flood risk reduction system relies upon designing Project approaches that consider existing infrastructure and environmental constraints, while also designing a flood risk reduction system in accordance with the regulatory standards (such as FEMA flood elevation standards, the NJDEP Flood Hazard Area Control Act, and local floodplain ordinances).

The following three Build Alternatives were developed through a year-long concept development process that considered engineering and environmental constraints while meeting the project's stated purpose and need. The project team met with stakeholders – public and private – as well as the community at-large to develop these project concepts. Concepts were eliminated from further consideration if they were determined to be infeasible, either due to engineering constraints or due to excessive time required to obtain permits. The concepts that were not eliminated were further refined into the following three Build Alternatives. The EIS will evaluate these as well as a No Action Alternative.

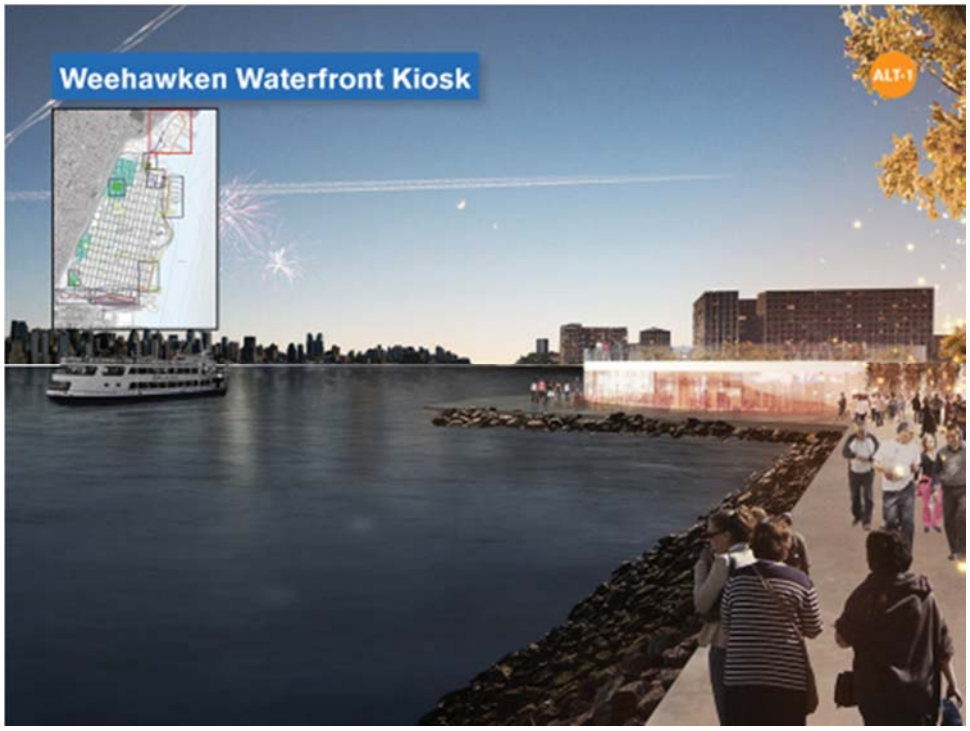
All resist structure heights described in this section are approximate. Structure heights will be finalized as part of the project's final design process.

3.1 Alternative 1

Resist Alignment

Alternative 1 (which was developed from the earlier Concept B and components of the southern alignment of Concept E) provides coastal flood risk reduction to approximately 98 percent of the population within the Study Area 100-year floodplain.

Alternative 1 provides the greatest level of flood risk reduction by locating the resist structures primarily along the waterfront. This alternative's resist structure generally follows the waterfront from the Lincoln Tunnel in Weehawken south to Weehawken Cove where it is envisioned that a boathouse (alternatively funded) will be incorporated into the structure. The resist structure at Lincoln Harbor ranges from 12 to 16 feet above ground level (note that all references to resist infrastructure height are in relation to height above ground level) and nine feet along the Cove. Urban placemaking amenities under consideration in this area include a new Lincoln Harbor ferry stop (see Photograph 1) and an improved park space along the north of Weehawken Cove (in the area of the existing park adjacent to Harbor Boulevard). In addition, a bermed and terraced Cove Park will be incorporated into the southwest corner of Weehawken Cove. This would include existing undeveloped land as well as the currently-developed Cove Park (adjacent to Harborside Lofts at 1500 Garden Street). Potential amenities at this park may include playgrounds, lawn areas, game courts, and a viewing deck overlooking Weehawken Cove (see Photograph 2).



Photograph 3-1: Lincoln Harbor Ferry Stop

Photograph 3-2: Cove Park

The alignment continues around the waterside of the Tea Building, at a height of between nine and 14 feet, and heads south in front of Maxwell Place at about 10 feet in height. The resist structure continues south along the waterfront to the intersection of Sinatra Drive North and Frank Sinatra Drive, just south of Maxwell Place Park where the ground elevation begins to rise, and the wall tapers down to meet it at height of between five feet and two feet. There will be a series of gates along the waterfront to allow access onto piers and across road intersections during non-flood conditions. Possible designs for the resist structure in this area include an elevated promenade north of the Tea Building, raised terraced parks adjacent to Shipyard Park, and bermed/terraced park areas at the location of the existing Maxwell Place Park (see Photograph 3).

Photograph 3-3: Maxwell Place Park

The resist structure also has a component along Sinatra Drive from 4th Street to 1st Street, in South Hoboken, where the design may consist of an elevated walkway and park space (up to five feet in height along Sinatra Drive) that ties into a deployable system running east/west on 1st Street (up to six to nine feet high). In the southern portion of the Study Area, two options will be analyzed: Option 1 features an alignment south of Observer Highway, within the rail yard (south of the proposed Hoboken Yard Redevelopment Area) at approximately five to 11 feet in height. Option 2 includes an alignment along Observer Highway from Washington Street to Marin Boulevard, on an alignment that runs behind NJ Transit offices ranging from seven to 12 feet in height. The alignment includes gates for access at various locations including the Marin Boulevard, Grove Street and Newark Avenue underpasses beneath the rail lines, as well as protection where HBLR tracks pass below the NJ Transit overpass in the southwest corner of the Study Area. Urban amenities in these areas include lighting, murals, seating, plantings and wayfinding/signage. See Figure 12. Sheeting will also be installed along the NJ Transit railroad embankment.

Delay, Store, Discharge

The DSD elements of the Project consist of three large stormwater detention facilities and approximately 61 small tanks (ROW sites) that will include new and/or improved stormwater management techniques designed to complement other efforts by the City of Hoboken as part of the Green Infrastructure Strategic Plan and multiple redevelopment plans (discussed further under Land Use). Details on individual sites and specific plans have been developed as part of the feasibility design. The text below describes the major components that comprise this element of the Project. The location of the proposed facilities are based on studies of the existing flooding "hotspots" in Hoboken.

BASF Site

The northwest corner of Hoboken south from the NHSA Treatment Plan is a natural topographical low point and catchment area where collection and delay/storage of stormwater can be enhanced by the development of the Northwest Park (BASF Property). The six-acre property is being considered for acquisition by the City of Hoboken as part of the Green Infrastructure Strategic Plan and is also included as part of Hoboken's Western Edge Redevelopment Plan. The site, which is currently paved and impermeable, is planned for conversion to green park space with an underground stormwater storage/holding tank. A new pump and outfall would be linked to this facility to provide a discharge from the overall catchment area. Amenities under consideration for this park follow three themes: destination, recreational and ecological. A destination park provides for trails and urban landscape features, a recreational park provides for developed recreational uses such as ball fields and skateboard areas and an ecological park provides an opportunity for the public to engage with native vegetation and wildlife.

NJ Transit Site

The area surrounded by the Hoboken Housing Authority (HHA) at Jackson and Harrison Streets from 2nd Street to 6th Street also serves as a natural low-lying catchment area. A high level storm sewer collection system will be added in this 17-acre development to support the discharge component of the Site and direct the stormwater overflow towards the west. On the west side of this neighborhood, a stormwater tank will be incorporated along the light rail line to provide storage of the water drained from the HHA area. A pump station would be incorporated to discharge overflows from the stormwater tank into the existing ditch located at the west side of the NJ Transit Light Rail. NJ Transit ditch currently conveys runoff from the Light Rail property and the Palisades Hill slope to an existing discharge at the Hudson River. Urban amenities under consideration include active and passive recreational options, such as playgrounds, green space and planted areas.

Block 10 Site

The site is located in the southwestern corner of Hoboken adjacent to Academy Bus facility and south of Paterson Avenue. Portions of this currently-paved parcel will be converted to a permeable park space allowing water to infiltrate into the ground. A high level storm sewer collection system will be added to this 8.0 acre watershed, stormwater runoff will be conveyed to a proposed underground detention facility where peak flows will be controlled and delayed before discharging into the existing NHSA combined sewer. Urban amenities under consideration include active and passive recreational options such as playgrounds, green space and game courts.

Pump Stations

Three pump stations will be required as part of the discharge component. One pump station is proposed to discharge the overflow from the proposed NJ Transit site detention facility, a force main from the pump station will cross under the HBLR and discharge to the existing ditch located at the west side of the HBLR tracks. A second pump station is required to discharge overflows from the BASF site detention tank. A 2,700 foot long force main will convey the runoff to a new discharge proposed at Weehawken Cove; and a third pump is proposed to the north of Clinton Street (north end of the existing NJ Transit ditch) in the vicinity of the NHSA treatment plant. The purpose of the Clinton Street pump station is to release flows from the ditch to compensate the additional flow discharged from the NJ Transit site, and to prevent surcharge of the existing ditch during backflow conditions. A 720-foot long force main will convey the runoff to a new discharge proposed at Weehawken Cove.

Two new outfall pipes in northern Weehawken Cove are proposed as the discharge component of the Project. One outfall would drain the flow of the existing ditch running along the western side of the HBLR line. This outfall is proposed to be located in the northern part of the Cove near Lincoln Harbor. The second outfall is proposed to be located north of Cove Park to drain the BASF site's catchment area via force main discharge.

Construction and Implementation

Construction for resist infrastructure of this alternative would begin in February 2019 and last 42 months. The construction would occur concurrently for the northern and southern resist features. Equipment required for this project includes: dump trucks, back hoes, pile drivers, concrete trucks and other assorted delivery trucks. Some street closures will be required, in particular for gate construction. Pile driving will be required over a 40 work month period. A total of 8-9,000 crew days will be required to complete this construction.

Recognizing funding limitations, the DSD portion under Alternative 1 is anticipated to be constructed over the next 15 to 20 years. DSD represent the framework for a future storm water strategy that will need to be implemented by the City of Hoboken as funding becomes available, and can be integrated into the city's existing plans.

Due to the project being in the early stages of planning and design, there are many unknown variables. Modifications to design may arise from obtaining more accurate existing information or other unforeseen deviations from the feasibility study brought about by outside sources (such as more accurate information regarding location of utilities). As a result, the contingency is approximately 22% of the total project cost.

The construction and final design costs of Resist and DSD are estimated individually as follows. These costs include the contingency factor.

- Resist: between $531.5 and $597.1 million
- DSD: between $131.4 and $153 million

The total cost of Alternative 1 is between $662.9 to 750.1 million. This amount is an approximate estimated total of the cost to construct Resist and DSD, as well as estimated cost factors for final design (permitting, engineering,

environmental monitoring and project management) and project contingencies. Should this Alternative be chosen, additional funding would need to be obtained for the completion of the Resist strategy.

3.2 Alternative 2

Resist Alignment

Alternative 2 was developed from the earlier Concept E with two modifications. First, the northern Hoboken portion of the alignment along the Tea Building waterfront walkway was moved to 15th Street (south of the Tea Building) to maintain a distinction from Alternative 1. Second, because of the length and height of structure required along Hudson Street or Shipyard Lane, as well as the significant number of gates required for each, the alignment was moved to Washington Street. Washington Street was chosen due to the width of the street to accommodate the necessary structure and potential to blend structural amenities into the commercial nature of the area. This alternative provides coastal flood risk reduction to approximately 86 percent of the population residing within the Study Area 100-year floodplain.

This alternative's resist structure begins near the HBLR Lincoln Harbor station at Waterfront Terrace at an initial height of about eight feet, traveling south towards Harbor Boulevard at a height of five to 13 feet. Opportunities for urban enhancement in the northern portion of the Study Area under Alternative 2 are limited due to siting conditions and include lighting, murals and seating. The resist features then run south along Weehawken Cove at nine feet where it is envisioned that a boathouse (alternatively funded) will be incorporated into the structure. In addition, a bermed and terraced Cove Park will be incorporated into the southwest corner of the Weehawken Cove. This would include existing undeveloped land as well as the currently-developed Cove Park (adjacent to Harborside Lofts at 1500 Garden Street). Potential amenities at this park may include playgrounds, lawn areas, game courts, and a viewing deck overlooking Weehawken Cove (see Photograph 2).

The structure continues to 15th Street, and travels east along 15th Street from the northern end of Garden to Washington Streets where it will be between five to eight feet high. Urban amenities in this area may include a bermed park long 15th Street in front of the Tea Building. The resist feature then continues south along Washington Street, tapering in height between 14th and 13th Streets to approximately three feet high. Street crossings will feature gates to allow for access during non-flood conditions. Consideration will be given to adapting the use of structures in a way to provide urban amenities and landscape enhancements, including elevated walkways and pocket parks, plantings and/or seating areas along Washington Street (see Photograph 4).

Photograph 3-4: Washington Street from 15th Street, facing south

There will then be two options in the south, along the Hoboken Terminal rail yard: Option 1 will feature an alignment south of Observer Highway, within the rail yard (south of the proposed Hoboken Yard Redevelopment Area) at approximately five to 11 feet in height. Option 2 will include an alignment along Observer Highway from Washington Street directly to Marin Boulevard. The alignment includes gates for access at various locations including the Marin Boulevard, Grove Street and Newark Avenue underpasses beneath the rail lines, as well as protection where HBLR tracks pass below the NJ Transit overpass in the southwest corner of the Study Area. Urban amenities in these areas include lighting, murals, seating, plantings and wayfinding/signage. See Figure 13. Sheeting will also be installed along the NJ Transit railroad embankment.

During a coastal storm surge event, water from the Hudson River is expected to inundate unprotected areas of the Hoboken waterfront. If the river water overtops the waterfront bulkhead during a storm event, water can enter into the storm sewer system through existing inlets and unsealed manhole covers. While Alternative 1 would prevent a storm surge from entering the city streets, Alternative 2 leaves portions of the city streets and sewer system unprotected. To prevent water intrusion into the existing sewers under Alternative 2, a separation of the sanitary/storm water collection system is proposed by the construction of a “High Level" storm sewer collection system. In addition to the installation of this new storm sewer system, the existing NHSA combined sewer inlets and manholes would be sealed and lined. This proposed drainage would be designed to prevent additional sewer backflow that could cause major flooding issues within the Alternative 2 protected areas during a storm surge event. Storm water collected in this “High Level” storm sewer system would gravity flow into the Hudson River.

Delay, Store, Discharge

See above description under Alternative 1.

Construction and Implementation

Construction for resist infrastructure under this alternative would begin in February 2019 and last 42 months. The construction would occur concurrently for the northern and southern resist features. Equipment required for this project includes: dump trucks, back hoes, pile drivers, concrete trucks and other assorted delivery trucks. Some street closures will be required, in particular for gate construction. Pile driving will be required over 20 work months. A total of 6-7,000 crew days will be required to complete this construction.

Recognizing funding limitations, the DSD portion under Alternative 1 is anticipated to be constructed over the next 15 to 20 years. DSD represent the framework for a future storm water strategy that will need to be implemented by the City of Hoboken as funding becomes available, and can be integrated into the city's existing plans.

Due to the project being in the early stages of planning and design, there are many unknown variables. Modifications to design may arise from obtaining more accurate existing information or other unforeseen deviations from the feasibility study brought about by outside sources (such as more accurate information regarding location of utilities). As a result, the contingency is approximately 22% of the total project cost.

The construction and final design costs of Resist and DSD are estimated individually as follows. These costs include the contingency factor.

- Resist: between $238.2 and $276.9 million
- DSD: between $131.4 and $153 million

The total cost of Alternative 2 is estimated between $369.6 to 429.9 million. This amount is an approximate estimated total of the cost to construct Resist and DSD, as well as estimated cost factors for final design (permitting, engineering, environmental monitoring and project management) and project contingencies. Should this Alternative be chosen, depending upon final design, additional funding for the Resist strategy may need to be obtained.

3.3 Alternative 3

Resist Alignment

Alternative 3 was developed from the earlier Concept A, which was revised to relocate portions of the resist alignment to areas that would minimize impacts on the community. The alternative utilizes a private alleyway that parallels 14th Street to extend to Washington Street to meet the same flood resist goals. Washington Street was again chosen due to the width of the street to accommodate the necessary structure and potential to blend structural amenities into the commercial nature of the area. This alternative provides coastal flood risk reduction to approximately 85 percent of the population residing within the Study Area 100-year floodplain.

This alternative's resist structure begins at eight feet in height near the HBLR Lincoln Harbor station at Waterfront Terrace, traveling south along HBLR rising to about 12 feet in height, and then continuing south along Weehawken Cove (nine feet high) towards Garden Street. Opportunities for urban enhancement in the northern portion of the Study Area under Alternative 3 are limited due to siting conditions and include lighting, murals and seating. It is envisioned that a boathouse (alternatively funded) will be incorporated into the structure. In addition, a bermed and terraced Cove Park will be incorporated into the southwest corner of the Weehawken Cove. This would include existing undeveloped land as well as the currently-developed Cove Park (adjacent to Harborside Lofts at 1500 Garden Street). Potential amenities at this park may include playgrounds, lawn areas, game courts, and a viewing deck overlooking Weehawken Cove (see Photograph 2).

A structure would then down the east side of Garden Street adjacent to the west of the Hudson Tea Parking Garage, starting at eight feet in height and tapering down to five feet in height. The structure along Garden Street may consist of an elevated planter with seating. The structure would then continue down the alleyway midway between 15th and 14th Streets from Garden to Washington Streets at four feet in height. Urban amenities within the alleyway could include planters (see Photograph 5). The structure would then travel south along Washington Street at three feet in height, ending between 14th and 13th Streets. Street crossings will feature gates to allow for access during non-flood conditions. Consideration will be given to adapting the use of structures in a way to provide urban amenities such as seating and landscape enhancements.

Photograph 3-5: Resist Features along the West Alleyway

There will then be two options: Option 1 will include an alignment south of Observer Highway, within the rail yard (south of the proposed Hoboken Yard Redevelopment Area) at approximately five to 11 feet in height. Option 2 will feature an alignment along Observer Highway from Washington Street directly to Marin Boulevard. The alignment includes gates for access at various locations including at the Marin Boulevard, Grove Street and Newark Avenue underpasses beneath the rail lines, as well as protection where HBLR tracks pass below the NJ Transit overpass in the southwest corner of the Study Area. Urban amenities in these areas include lighting, murals, seating, plantings and wayfinding/signage. See Figure 14. Sheeting will also be installed along the NJ Transit railroad embankment.

During a coastal storm surge event, water from the Hudson River is expected to inundate unprotected areas of the Hoboken waterfront. If the river water overtops the waterfront bulkhead during a storm event, water can enter into the storm sewer system through existing inlets and unsealed manhole covers. While Alternative 1 would prevent a storm surge from entering the city streets, Alternative 3 leaves portions of the city streets and sewer system unprotected. To prevent water intrusion into the existing sewers under Alternative 3, a separation of the sanitary/storm water collection system is proposed by the construction of a “High Level" storm sewer collection system. In addition to the installation of this new storm sewer system, the existing NHSA combined sewer inlets and manholes would be sealed and lined. This proposed drainage would be designed to prevent additional sewer backflow that could cause major flooding issues within the Alternative 3 protected areas during a storm surge event. Storm water collected in this “High Level” storm sewer system would gravity flow into the Hudson River.

Delay, Store, Discharge

See above description under Alternative 1.

Construction and Implementation

Construction for resist infrastructure in Alternative 3 would begin in February 2019 and last 40 months. The construction would occur concurrently for the northern and southern resist features. Equipment required for this project includes: dump trucks, back hoes, pile drivers, concrete trucks and other assorted delivery trucks. Some street closures will be required, in particular for gate construction. Pile driving will be required over 18 work months. A total of 6,000 crew days will be required to complete this construction.

Recognizing funding limitations, the DSD portion under Alternative 1 is anticipated to be constructed over the next 15 to 20 years. DSD represent the framework for a future storm water strategy that will need to be implemented by the City of Hoboken as funding becomes available, and can be integrated into the city's existing plans.

Due to the project being in the early stages of planning and design, there are many unknown variables. Modifications to design may arise from obtaining more accurate existing information or other unforeseen deviations from the feasibility study brought about by outside sources (such as more accurate information regarding location of utilities). As a result, the contingency is approximately 22% of the total project cost.

The construction and final design costs of Resist and DSD are estimated individually as follows. These costs include the contingency factor.

- Resist: between $224.5 and $268.5 million
- DSD: between $131.4 and $153 million

The total Cost of Alternative 3 is between $355.9 to 421.5 million. This amount is an approximate estimated total of the cost to construct Resist and DSD, as well as estimated cost factors for final design (permitting, engineering, environmental monitoring and project management) and project contingencies. Should this Alternative be chosen, depending upon final design, additional funding for the Resist strategy may need to be obtained.

4.0 NATIONAL AMBIENT AIR QUALITY STANDARDS

Since it was originally passed in 1955, the Clean Air Act (CAA) had been the primary basis for regulating air pollutant emissions. The amendments to the Clean Air Act were passed in 1970, allowing USEPA to delegate responsibility to state and local governing bodies. This allowed each state/local government the opportunity to prevent and control air pollution at the source. The 1970 amendments (Clean Air Act Amendments; CAAA) mandated that the USEPA establish ceilings for certain pollutants based upon the identifiable effects each pollutant may have on public health and welfare. Subsequently, the USEPA promulgated the revised regulations which set National Ambient Air Quality Standards (NAAQS). Current NAAQS are established for carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), lead (Pb), sulfur dioxide (SO_2), inhalable particulate matter smaller than 10 micrometers (PM_{10}) and fine particulate matter smaller than 2.5 micrometers ($PM_{2.5}$).

NAAQS are divided into two (2) types of criterion: primary standards to protect the public health with an adequate margin of safety and secondary standards to protect the public welfare from any known or anticipated adverse effect of a pollutant (e.g. soiling, vegetation damage, material corrosion).

Each criteria pollutant is monitored on a continuous basis throughout the State of New Jersey by NJDEP. Currently NJDEP maintains thirty-nine (39) air quality monitoring stations, located throughout sixteen of the twenty-one NJ Counties. Each air quality monitoring station documents one or more criteria pollutants and not all pollutants are documented within each county. Some NJDEP monitoring stations also document acid deposition, black carbon, measured benzene, toluene, ethyl benzene, Xylenes, mercury, meteorological parameters, total reactive oxides of nitrogen, air toxics as well as visibility. Major objectives of monitoring air quality are to provide an early warning system for pollutant concentrations, assess air quality in light of public health and welfare standards, and also track trends or changes in these pollutant levels. Primary and secondary national ambient air quality standards are shown in Table 4-1.

Table 4-1: United States Environmental Protection Agency
National Ambient Air Quality Standards

POLLUTANT	AVERAGING PERIOD	NATIONAL PRIMARY	NATIONAL SECONDARY
Carbon Monoxide	1 hour 8 hour	35 ppm 9 ppm	- -
Ozone[1]	8 hour	0.070 ppm	0.070 ppm
Nitrogen Dioxide	Annual 1 hour	53 ppb 100 ppb	53 ppb -
Lead	Rolling 3 month Average	0.15 µg/m^3	0.15 µg/m^3
Sulfur Dioxide[2]	3 hour 1 hour	-75 ppb	0.5 ppm -
Inhalable Particulates	24 hour	150 µg/m^3	150 µg/m^3
Fine Particulates	24 hour Annual	35 µg/m^3 12 µg/m^3	35 µg/m^3 15 µg/m^3

Source: https://www.epa.gov/criteria-air-pollutants/naaqs-table

5.0 EXISTING CONDITIONS

Section 107 of the 1970 Clean Air Act Amendments requires USEPA and states throughout the country to identify areas not meeting the NAAQS. An area which does not meet a standard is designated as nonattainment. The Hoboken Rebuild By Design project is located within Hudson County, which is designated as attainment for NO_2, Pb, SO_2, and PM_{10}, nonattainment for O_3 and maintenance for $PM_{2.5}$ and CO (area was previously in nonattainment but now meets standards).

The entire state of New Jersey is classified as in O_3 nonattainment, including Hudson County. New Jersey is located within the New York – N. New Jersey – Long Island, NY-NJ-CT Eight-Hour (2008) Moderate Non-Attainment area. Naturally occurring O_3 in the upper atmosphere protects the population from harmful ultraviolet rays. Ground-level O_3 is formed when nitrogen oxides (NO_x) and volatile organic compounds (VOC) react in the presence of sunlight and heat. Ground-level O_3 can cause serious adverse health effects by damaging cells that line our airways. Therefore, O_3 can aggravate respiratory disease and cause the public to be more susceptible to respiratory infections. The incomplete combustion of fossil fuel, power plants and other sources of combustion emit the primary source of NO_x. In recent years, documented O_3 levels in New Jersey have been decreasing[1]. Effective December 28, 2015, the USEPA created a more stringent ambient O_3 standard, and therefore precursors (NO_x and VOCs) are monitored very carefully.

To determine compliance with O_3 standards and assess progress towards meeting the NAAQS, a design value is calculated by USEPA based on actual air quality monitoring data over the most recent three-year period (2013-2015). The Hudson County O_3 design value, based on fourth highest 8-hour annual concentrations and respective standard is presented in Table 5-1. The 8-hour O_3 design value at a Hudson County monitoring station is 0.071 parts per million (ppm) and therefore exceeds the standard of 0.070 ppm.

Table 5-1: Ozone Design Value, Hudson County, City of Bayonne (2013-2015)

YEAR	8-HOUR[1] (PPM)
Design Value[2]	0.071
Standard	0.070

[1] – 4th highest
[2] – Design value computed for latest design value period (2013-2015) using Federal Reference Method.
Source: https://www.epa.gov/air-trends/air-quality-design-values

In 2013, USEPA redesignated Hudson County along with twelve other New Jersey counties to $PM_{2.5}$ attainment. Hudson County is therefore in $PM_{2.5}$ maintenance and is subject to the same requirements as a $PM_{2.5}$ nonattainment area. These requirements include being held to a maintenance plan.

[1] - Environmental Trends Report, NJDEP, Division of Science, Research, and Environmental Health, Updated 3/2016, http://www.nj.gov/dep/dsr/trends/

Particulate matter includes very small liquid and solid particles suspended within the lower atmosphere. Particulate matter irritates the membranes of the respiratory system and therefore may affect sensitive groups including the elderly, individuals with cardiopulmonary disease such as asthma, and children. USEPA is concerned with inhalable particulate matter which is not filtered by the nose and throat like larger particulates and can reach deep in the lungs causing lung disease, emphysema or lung cancer. Fine particulate matter smaller than 2.5 micrometers in diameter is created from chemical reactions in the atmosphere and through fuel combustion by sources such as motor vehicles and power generation. The NAAQS was revised in 2012 to provide a more stringent annual $PM_{2.5}$ standard.

NJDEP began monitoring $PM_{2.5}$ levels in 1999. To determine compliance with $PM_{2.5}$ standards, a design value is calculated by USEPA based on actual monitoring data over the most recent three-year period (2013-2015). $PM_{2.5}$ design values (24-hour and annual mean) based on 98th percentile 24-hour concentration and annual mean concentrations and their respective standards are presented in Table 5-2. The 24-hour and annual mean design values at a Hudson County monitoring station (355 Newark Avenue, Jersey City) are 27 micrograms per cubic meter ($\mu g/m^3$) and 10.8 $\mu g/m^3$, respectively. Both $PM_{2.5}$ design values meet standards at this Hudson County representative monitoring location.

Table 5-2: $PM_{2.5}$ Design Values, Hudson County, 355 Newark Avenue, Jersey City (2013-2015)

YEAR	24-HOUR CONCENTRATION[1] ($\mu G/M^3$)	ANNUAL MEAN CONCENTRATION($\mu G/M^3$)
Design Value[2]	27	10.8
Standard	35	12.0

[1] - 98th percentile concentration
[2] - Design value computed for latest design value period (2013-2015) using Federal Reference Method.
Source: https://www.epa.gov/air-trends/air-quality-design-values

After many years of demonstrating CO attainment, Hudson County was redesignated to attainment status in 2004. Hudson County is therefore in CO maintenance and is subject to the same requirements as a CO nonattainment area. A CO maintenance area must maintain the NAAQS for 20 years by following two sequential 10-year plans.

The incomplete combustion of fossil fuel creates a spectrum of pollutant by-products. CO by volume is the most prominent, when compared to other mobile-source pollutants for typical passenger vehicles. CO is colorless/odorless poisonous gas that is generally found adjacent to intersections or congested roadways. Acceleration/decelerating and idling vehicles emit higher emissions than steady-state speed vehicles.

To determine compliance with CO standards, a design value is calculated by USEPA based on actual air quality monitoring data over the most recent three-year period (2013-2015). CO design values representing Hudson County, based on the 2nd highest 1-hour and 8-hour annual concentrations, and their respective standards are presented in Table 5-3. CO design values at a Hudson County monitoring station are 2.1 ppm and 1.6 ppm, respectively. Both 1- and 8-hour CO design values meet concentration standards within Hudson County.

Table 5-3: CO Monitoring Data, Hudson County

2828 Kennedy Boulevard, Jersey City (2013-2015)

YEAR	1-HOUR CONCENTRATION[1](PPM)	8-HOUR CONCENTRATION[2] (PPM)
Design Value[3]	2.1	1.6
Standard	35.0	9.0

[1] - 2nd highest maximum
[2] - 2nd highest maximum
[3] - Design value computed for latest design value period (2015) using Federal Reference Method.
Source: https://www.epa.gov/air-trends/air-quality-design-values

6.0 REGULATORY SETTING

Section 176(c)(1) of the CAA requires Federal agencies to assure that their actions conform to applicable implementation plans for achieving and maintaining the NAAQS. A Federal action must not cause or contribute any new NAAQS violations, increase the frequency or severity of any NAAQS violations, or delay timely attainment of any NAAQS or any required interim emission reductions or other milestones in nonattainment and/or maintenance areas. Since the project will receive federal funding, it is therefore subject to General Conformity Regulations (GCR). As detailed within, the project is located within Hudson County which is designated as O_3 nonattainment as well as $PM_{2.5}$ and CO maintenance.

In 1993, the USEPA issued general conformity regulations (40 CFR Part 93, Subpart B) pertaining to procedures and criteria for determining Federal action conformity. A conformity determination is required for each criteria pollutant or precursors where the total of direct and indirect emissions of the criteria pollutant or precursor in a nonattainment or maintenance area caused by a Federal action which would equal or exceed specific emissions per year. Pursuant to 40 CFR 93.153, *de minimis* levels or minimum thresholds have been established for specific pollutants. Applicability analyses performed which exceed these thresholds would indicate the need to perform a conformity determination for the project.

Since the project location is designated as O_3 nonattainment, pollutant precursors (NO_x and VOCs) were estimated. In addition, CO and $PM_{2.5}$ emissions were estimated due to Hudson County's maintenance designation for these pollutants. Table 6-1 presents *de minimus* levels for pollutants relevant to this project.

Table 6-1: ***Project-Related De Minimis Air Pollutant Thresholds***

POLLUTANT	ALLOWABLE TONS/YEAR
CO	100
NO_x	100
VOC	50
$PM_{2.5}$	100
SO_2	100

Note:
Proposed project is not expected to cause indirect emissions. All *de minimis* thresholds listed above would therefore apply to direct emissions only.
Source: https://www.epa.gov/general-conformity/de-minimis-emission-levels

7.0 OPERATIONAL-RELATED ASSESSMENT METHODOLOGY

As part of the Delay-Store-Discharge element of the project, three (3) pump stations will be constructed throughout Hoboken. Emergency generators associated with pump stations were assumed to be diesel-powered. Specific generator manufacturers and models have not been designated for each of the pump stations at this time. Based on conceptual review of equipment needs, it can be stated that the NJ Transit site pump station is estimated to require a 50 to 60 kilowatt (kW) emergency generator while BASF and Clinton Street pump stations are estimated to require a 160 to 175 kW generator at each site. A General Permit (GP-005A) will need to be acquired for each of the emergency generators through the NJDEP Air Quality Permitting Program.

USEPA's NONROAD2008a Emission Model (NONROAD), incorporated within the most updated motor vehicle emission simulator (MOVES2014a)[2] was utilized to obtain emission rates for generator sets corresponding with 60 kW (approximately 93 horsepower) and 175 kW (approximately 267 horsepower) generators. The model included temperature profiles for Hudson County provided by NJDEP. Air emissions were estimated assuming each generator will undergo a weekly test, each for one hour duration.

Primary pollutants from diesel internal combustion are NO_x, total organic compounds (TOC), CO and particulates. PM and SO_2 are the only diesel pollutants that are dependent on fuel sulfur content[3]. Fuel supply and fuel formulation data assumed ultra-low sulfur fuel (ULSF)[4]. Emission factors for CO, NO_x (NO and NO_2), VOC, $PM_{2.5}$ and SO_2 were obtained for each month related to each emergency generator size for the "Build" 2022 calendar year. A review of 2022 $PM_{2.5}$ and SO_2 emission factors averaged over the entire year for emergency generators was performed and revealed SO_2 emission factors are 97 to 99% less than $PM_{2.5}$ factors. Therefore, $PM_{2.5}$ emission analyses provide a conservative SO_2 surrogate as both pollutants possess the same *de minimis* threshold of 100 tons/year.

[2] USEPA MOVES2014a User Guide, EPA-420-B-15-095, November 2015.
[3] USEPA *Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling – Compression-Ignition,* EPA-420-R-10-018, NR-009d, July 2010.
[4] Analysis performed including diesel fuel formulation with sulfur content of 11 ppm. A sulfur content of 11 ppm is a default value representative of the average sulfur content of diesel fuel meeting the 15 ppm standard, as fuels meeting this standard are produced with a compliance margin to account for differences in testing and contamination downstream. A sulfur content value of 11 ppm is a default fuel formulation within MOVES2014a tables.

8.0 OPERATIONAL-RELATED AIR QUALITY ASSESSMENT RESULTS

Pursuant to 40 CFR 93.153, *de minimis* levels or minimum thresholds have been established for specific pollutants. Applicability analyses performed which exceed these thresholds would indicate the need to perform a conformity determination for the project. Based on the operational-related air emissions analysis performed for Delay-Store-Discharge element of the project, emissions estimated for all three generators under 2022 "Build" condition do not exceed *de minimis* thresholds. Table 8-1 details predicted "Build" CO, NO_x, VOC, and $PM_{2.5}$ levels for CY 2022. Appendix A includes emergency generator emission worksheet. As detailed within, the $PM_{2.5}$ analysis provides a conservative surrogate for SO_2 emissions.

Table 8-1: Predicted 2022 Emergency Generator Emissions Compared to De Minimis Thresholds (tons/year)

	CO	NO_X	VOC	$PM_{2.5}$
2022	0.03	0.09	0.01	0.01
Allowable (tons/yr)	100	100	50	100

Source: Paul Carpenter Associates, Inc. 2016

9.0 CONSTRUCTION-RELATED ASSESSMENT METHODOLOGY

Construction of the proposed project is expected to occur over approximately 3.5 years (44 months). The study area is densely populated with sensitive receptors such as residential dwellings, schools, senior housing developments and a hospital. Heavy construction activities related to the proposed construction adjacent to sensitive receptors may have the potential to impact air quality. In addition, localized areas of congestion and elevated emissions may result from truck deliveries and contractor vehicles within the study area roadway network.

While only deliveries are expected to begin in December of 2018, construction is expected to commence in January 2019 and complete in July 2022. Anticipated construction activities were separated into work areas, equipment quantities and number of crews for each alternative. Construction schedules related to each alternative are included within Appendix B. Construction-related emissions were calculated for pollutants (CO, NO_x, VOC, and $PM_{2.5}$) for each year of construction over the course of the project by alternative.

USEPA's NONROAD, incorporated within MOVES2014a was utilized to develop emission rates for various sizes and types of construction equipment. The model included temperature profiles for Hudson County provided by NJDEP. Primary pollutants from diesel internal combustion are NO_x, total organic compounds (TOC), CO and particulates. PM and SO_2 are the only diesel pollutants that are dependent on fuel sulfur content. Fuel supply and fuel formulation data assumed ULSF. Emission factors for CO, NO_x (NO and NO_2), VOC, $PM_{2.5}$ and SO_2 were obtained for each month related to on-site construction equipment necessary to construct the project during CY 2019, 2020, 2021 and 2022.

Although emission factors were developed for SO_2, actual emissions (in tons per year) were not computed for this pollutant. Specifically, SO_2 emissions are a precursor to the formation of $PM_{2.5}$, and both pollutants possess the same *de minimis* threshold of 100 tons/year. Therefore, $PM_{2.5}$ emission analyses provide a conservative SO_2 surrogate. For each construction year analyzed, $PM_{2.5}$ and SO_2 emission factors were averaged over the entire year for each piece of construction equipment assessed. Upon comparison, SO_2 emission factors are approximately 96 to 99% less than $PM_{2.5}$ factors, depending on the construction year and specific equipment.

NONROAD provides a limited equipment database. Preliminary equipment necessary to construct resist structures has been identified by the project team. Emission factors provided by NONROAD for the most representative equipment type was utilized and presented within the analysis. Since equipment sizes have not been identified for all equipment types, a conservative analysis was performed utilizing the highest emission rate per equipment type for each analysis year. Preliminary equipment list identified by the project team and most representative NONROAD equipment category utilized for the analysis is presented within Table 9-1.

Table 9-1: Construction Equipment Categories

PRELIMINARY EQUIPMENT LIST	NONROAD EQUIVALENT EQUIPMENT
Excavators	Excavators
Dump Trucks	Dumpers/Tenders
Backhoes	Tractors/Loaders/Backhoes
Pile Driving Rigs	Bore/Drill Rigs
Sheet Pile Driving Rigs	Bore/Drill Rigs
Cranes	Cranes
Hydraulic Hoe Ram	NA
Concrete Mixer Trucks	Cement & Mortar Mixers
Concrete Pump Trucks	Pumps

NA – Since hydraulic hoe ram is mounted to excavator, backhoe, or driving rig and receives power from the mounted equipment, no additional emissions were assumed for the hoe ram attachment.

Excavators, dump trucks, backhoes, pile driving rigs, sheet pile driving rigs, cranes, cement mixer trucks and concrete pump trucks necessary to construct resist structures were assumed to be diesel-powered equipment. Worst-case emission factors obtained from NONROAD in grams/brake-horsepower-hour were converted to grams/second for each piece of non-road equipment, assuming continuous operation. Estimates assumed construction activities would be performed five days a week (weekdays). To adjust for actual utilization and obtain hourly emissions, emission rates were subsequently multiplied by the reasonable horsepower engine sizes, number of pieces of equipment as well as a usage factor accounting for the percentage of time the equipment is in operation during an 8-hour work shift.

Pile driving and sheet pile driving rigs (bore/drill rigs) necessary to construct Resist structures were preliminarily scheduled to be in operation anywhere from three to six months a year for the duration of construction (approximately 3.5 years), depending on the year and alternative (See construction schedule provided in Appendix B). Emission factors were obtained for each month of every year for all construction equipment. Since actual months of construction activities associated with pile driving and sheet pile driving are subject to change, an average emission factor associated with bore/drill rigs for each calendar year was utilized within air pollutant emission calculations.

Emission factors for vehicles traveling within the work site as well as to/from the site, such as delivery trucks, cement mixer trucks and cement pump trucks, were estimated utilizing MOVES2014a and Hudson County database files provided by NJDEP. Emission rates, in units of grams-per-vehicle-mile (g/veh-mi) were estimated for each month of the analysis year for the speed bin accounting for average speeds equal to or greater than 2.5 mph and less than 7.5 mph (speed bin 2) for on-site trucks and average speeds equal to or greater than 27.5 and less than 32.5 mph (speed bin 7) for on-road trucks. Delivery trucks, cement mixer trucks and cement pump trucks were assumed to

be single unit short-haul trucks (source type 52) traveling 0.5 miles within the site and an average travel route of 75 miles each way to the site, or 150 miles round trip.

In addition, contractor vehicles commuting to/from the work site were estimated utilizing MOVES2014a and Hudson County database files provided by NJDEP. Emission rates, in units of g/veh-mi, were estimated for each month of the analysis year for the speed bin accounting for average speeds equal to or greater than 27.5 mph and less than 32.5 mph (speed bin 7). Of the potential passenger vehicles, passenger trucks resulted in higher emissions than passenger cars. Therefore, the analysis was performed assuming passenger trucks (source type 31) commuting an average of 75 miles each way to the site, or 150 miles round trip. The number of on-site crews per month for each alternative is included within the construction schedule detailed within Appendix B. The number of contractors per crew was assumed to be 4.31 workers.

All vehicular traveling emissions estimated operating condition, without assessing start, evaporative, refueling, extended idle, well-to-pump or auxiliary power exhaust. Table 9-2 provides the delivery and light duty truck emission processes evaluated based on each pollutant. Conservatively, the highest emission rate within operating hours (7:00 AM to 3:00 PM) for this vehicle type was analyzed for each month and each analysis year.

Table 9-2: On-Site Truck Pollutant Processes Assessed

POLLUTANT	POLLUTANT PROCESSES
CO	Running + Crankcase Exhaust
NOx	Running + Crankcase Exhaust
VOC	Running + Crankcase Exhaust
$PM_{2.5}$	Running + Crankcase + Brakewear + Tirewear Exhaust

10.0 CONSTRUCTION-RELATED AIR QUALITY ASSESSMENT RESULTS

Alternative 1 requires 15,500 equipment days for either Option 1 or Option2 in order to construct resist structures. This number of equipment days is the highest among the alternatives. Pursuant to 40 CFR 93.153, *de minimis* levels or minimum thresholds have been established for specific pollutants. Applicability analyses performed which exceed these thresholds would indicate the need to perform a conformity determination for the project. Based on the construction-related air emissions analysis performed for Alternative 1, Option 1 and Alternative 1, Option 2, emissions estimated for each construction calendar year do not exceed *de minimis* thresholds. Construction-related air emission worksheets are included within Appendix C. Table 10-1 details predicted CO, NO_x, VOC, and $PM_{2.5}$ levels by year, as a result of Alternative 1, Options 1 and 2. As detailed within, the $PM_{2.5}$ analysis provides a conservative surrogate for SO_2 emissions.

Table 10-1: Predicted Emissions Compared to *De Minimis* Thresholds – Alternative 1, Option 1 / Option 2 (tons/year)

	CO	NOx	VOC	$PM_{2.5}$
2019	34.2 / 34.2	26.3 / 26.3	5.0 / 5.0	3.1 / 3.1
2020	30.2 / 30.2	23.1 / 23.2	4.2 / 4.2	2.5 / 2.5
2021	25.4 / 25.4	19.3 / 19.3	3.6 / 3.6	2.2 / 2.2
2022	7.8 / 7.8	6.2 / 6.2	1.0 / 1.0	0.6 / 0.6
Allowable (tons/yr)	100	100	50	100

Source: Paul Carpenter Associates, Inc. 2016

Alternative 2 requires less equipment days than Alternative 1 in order to construct resist structures. Option 1 requires 13,480 equipment days while Option 2 requires 13,120 equipment days. Pursuant to 40 CFR 93.153, *de minimis* levels or minimum thresholds have been established for specific pollutants. Applicability analyses performed which exceed these thresholds would indicate the need to perform a conformity determination for the project. Based on the construction-related air emissions analysis performed for Alternative 2, Option 1 and Alternative 2, Option 2, emissions estimated for each construction calendar year do not exceed *de minimis* thresholds. Construction-related air emission worksheets are included within Appendix C. Table 10-2 details predicted CO, NO_x, VOC, and $PM_{2.5}$ levels predicted by year as a result of Alternative 2, Options 1 and 2. As detailed within, the $PM_{2.5}$ analysis provides a conservative surrogate for SO_2 emissions.

Table 10-2: Predicted Emissions Compared to *De Minimis* Thresholds – Alternative 2, Option 1 / Option 2 (tons/year)

	CO	NOx	VOC	$PM_{2.5}$
2019	31.1 / 28.7	24.5 / 22.0	4.8 / 4.3	2.9 / 2.6
2020	26.9 / 26.8	21.0 / 21.0	3.9 / 3.9	2.4 / 2.3
2021	24.6 / 22.8	18.9 / 17.8	3.6 / 3.3	2.2 / 2.0
2022	6.9 / 7.4	5.8 / 6.3	1.0 / 1.0	0.6 / 0.6
Allowable (tons/yr)	100	100	50	100

Source: Paul Carpenter Associates, Inc. 2016

Alternative 3 requires the least number of equipment days to construct resist structures among the three (3) alternatives with 9,300 for Option 1 and 10,300 for Option 2. Pursuant to 40 CFR 93.153, *de minimis* levels or minimum thresholds have been established for specific pollutants. Applicability analyses performed which exceed these thresholds would indicate the need to perform a conformity determination for the project. Based on the construction-related air emissions analysis performed for Alternative 3, Option 1 and Alternative 3, Option 2, emissions estimated for each construction calendar year do not exceed *de minimis* thresholds. Construction-related air emission worksheets are included within Appendix C. Table 10-3 details predicted CO, NO_x, VOC, and $PM_{2.5}$ levels predicted by year as a result of Alternative 3, Options 1 and 2. As detailed within, the $PM_{2.5}$ analysis provides a conservative surrogate for SO_2 emissions.

Table 10-3: Predicted Emissions Compared to *De Minimis* Thresholds – Alternative 3, Option 1 / Option 2 (tons/year)

	CO	NOx	VOC	$PM_{2.5}$
2019	21.0 / 22.9	15.3 / 17.2	3.2 / 3.4	1.9 / 2.1
2020	18.7 / 23.4	13.8 / 18.0	2.6 / 3.3	1.5 / 2.0
2021	18.2 / 20.0	13.3 / 15.1	2.5 / 2.8	1.5 / 1.7
2022	5.0 / 6.4	4.0 / 5.4	0.7 / 0.9	0.4 / 0.5
Allowable (tons/yr)	100	100	50	100

Source: Paul Carpenter Associates, Inc. 2016

11.0 CONSTRUCTION-RELATED AIR QUALITY MITIGATION

Construction management of the proposed project will include general environmental measures imposed on contractors. Construction work would be planned and executed in a manner that will minimize air emissions and will be accomplished in light of the site's proximity to users of the surrounding environment. Air quality control measures will include:

- use of ultra-low sulfur diesel fuel to power construction equipment,
- limiting idling times to less than three minutes on diesel and gasoline powered engines pursuant to N.J.A.C. 7:27-14 and N.J.A.C. 7:27-15,
- locating diesel powered exhausts away from local residential or building air intakes,
- limiting on-site equipment to operating speeds of 5 mph to reduce dust and particulate pollutants from tires and brakes,
- spraying suppressing agent on any dust pile,
- utilizing water or appropriate liquids for dust control during demolition, land clearing, grading; and on materials stockpile or surface,
- covering open-body trucks when transporting materials,
- removing surface materials promptly,
- all diesel construction equipment at the site for more than ten days are required to meet USEPA Tier 4 non-road emission standards or be retrofitted with the best available emission control technology that is technologically feasible and verified by the USEPA or the California Air Resources Board (CARB) to reduce particulate matter emissions by at least 85 percent for engines 50 hp and greater and by a minimum of 20 percent for engines less than 50 hp,
- All Tier 0 and Tier 1 non-road diesel engines are restricted from the site, and
- truck haul routes will be determined in order to minimize impact to sensitive receptors such as residential areas, hospitals, schools, daycare facilities, senior citizen housing, and convalescent facilities.

While project-related air emissions have been estimated to fall below associated thresholds, schools within close proximity of construction activities will be reviewed under the final engineering phase. Specific schools, based on alternative, were recommended to close windows during high noise periods which will also provide a reasonable precaution to minimize fugitive dust exposure. Under final design phase, the building HVAC systems occupied by these schools will be reviewed in order to determine whether additional filtering systems may be necessary.

12.0 COMPLIANCE WITH PROJECT-LEVEL CONFORMITY CRITERIA

The General Conformity Regulations (GCR), promulgated on November 30, 1993, with recent revisions listed within 40 CFR 93 Subpart B, are applicable to actions requiring federal funding and/or approval (e.g. federal permits). Since the project will receive federal funding, it is therefore subject to GCR. The applicability analysis estimated emissions from both, operational and construction activities, and compared those emissions to the *de minimis* levels provided within 40 CFR 93.153(b)(1). Since predicted CO, NO_x, VOC, and $PM_{2.5}/SO_2$ levels are below *de minimis* levels, the project meets GCR. Based on the assessment performed for the project, the project would not create any new violations, nor increase the frequency or severity of any existing violations of the NAAQS. Therefore, the project, irrespective of alternative, complies with the Clean Air Act.

13.0 GREENHOUSE GAS ASSESSEMENT

Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in NEPA Reviews (August 1, 2016)[5] recommends quantification of both direct and indirect greenhouse gas (GHG) emissions by alternative to ensure the public and all agencies involved possess the information necessary to make informed decisions.

A GHG assessment was therefore performed related to construction of each alternative as well as the emergency generators assumed to be operational by 2022. It is important to note that the GHG assessment estimated emissions associated with project activities up to, and including 2022, however not full life-cycle emissions of the project.

Three primary tracked greenhouses gases produced by fossil fuel combustion include: carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O). Construction of the project is expected to occur over 3.5 years (44 months) and will involve fossil fuel combustion due to on-road and off-road mobile sources as well as construction equipment. The only direct source of GHG emissions expected to result from the project's operation is three (3) diesel-powered emergency generators associated with pump stations, which require weekly testing.

According to the USEPA, each greenhouse gas has a different effect on the earth's atmosphere because they absorb energy differently and have differing lifetimes (i.e. some stay in the atmosphere longer than others). In order to compare global warming impacts of different gases and quantify total greenhouse gas emissions, a factor called Global Warming Potential (GWP) was created. The GWP is a measure of how much energy the emissions of one ton of a gas will absorb over a given period of time, relative to the emissions of one ton of CO_2. By definition, CO_2 has a GWP of 1 because it is the reference gas. Multiplying each pollutant by its GWP factor yields the CO_2 equivalent (CO_2e).

The USEPA's MOVES2014a directly calculates CO_2e for on-road vehicles utilizing GWP values of 1, 25 and 298 for CO_2, CH_4, and N_2O, respectively. These on-road construction vehicles include vehicles traveling within the work site as well as to/from the site such as delivery trucks, cement mixer trucks and cement pump trucks. In addition, contractor vehicles commuting to/from the work site were included within on-road CO_2e emissions.

NONROAD2008, which is incorporated into the MOVES2014a model and utilized to calculate emissions from non-road sources (i.e. stationary on-site construction equipment), does not directly compute CO_2e. Therefore, post-processing was performed for all non-road equipment whereby CO_2, CH_4, and N_2O emissions were scaled by the appropriate GWP factors. It should be noted that GWP values change over time.

NONROAD2008 provides emission factors in grams/horsepower-hour for CO_2 and CH_4 for a range of equipment sizes. Conservatively, the highest emission factors yielded by the model were utilized to calculate CO_2 and CH_4

[5] *https://www.whitehouse.gov/sites/whitehouse.gov/files/documents/nepa_final_ghg_guidance.pdf*

emissions in metric tons (mt) per year. Generally, construction activities were assumed to occur on weekdays only for an 8-hour day. These assumptions were utilized to compute monthly emissions, which were subsequently converted to emissions in mt per year.

Since NONROAD2008 does not calculate emissions factors for N_2O, additional calculations were necessary to estimate N_2O emissions. Emissions for N_2O are based on the volume of fuel combusted. Since fuel usage information is unknown, a USEPA default diesel fuel emission factor for CO_2 of 10.21 kg CO_2/gallon was utilized to estimate fuel combustion. Subsequently, gallons of diesel fuel were multiplied by an N_2O emission factor developed by USEPA for non-road diesel construction equipment, which is based on mass of emissions per gallon of fuel[6]. Finally, N_2O emissions are estimated in mt per year by applying the appropriate GWP.

Emergency generators associated with three (3) pump stations will require weekly testing of equipment operations. GHG emissions associated with weekly testing were estimated for 2022, assuming pump stations will be constructed and operational in 2022. Table 13-1 presents CO_2e emissions estimates based on alternative including construction in each year. The total presented in the 2022 column in Table 13-1 includes the 18 metric tons of CO_2e expected to be emitted by the emergency generator annually once it is in operation. Appendix D includes CO_2e air emission worksheets.

Table 13-1: CO2e Emission Estimates (reported in metric tons)

ALTERNATIVE	2019	2020	2021	2022
Alternative 1, Option 1	4,011	3,709	2,987	1,046
Alternative 1, Option 2	4,011	3,721	2,987	1,045
Alternative 2, Option 1	3,549	3,245	2,819	899
Alternative 2, Option 2	3,199	3,241	2,735	1,003
Alternative 3, Option 1	2,285	2,319	2,220	625
Alternative 3, Option 2	2,516	2,836	2,439	796

[6] IPCC, 2007: Climate Change 2007: Synthesis Report. Contribution of Working Groups, I, II, and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, Pachauri, R.K. and Reisinger, A. (eds.)]. IPCC, Geneva Switzerland, 104 pp.

The 2016 CEQ Final Guidance does not establish any particular quantity of GHG emissions as "significantly" affecting the quality of the human environment. The intent of the Guidance is to help federal agencies ensure their analysis of potential GHG emissions and effect of climate change in a NEPA document is commensurate with the extent of the effects of the proposed action. Furthermore, the Guidance specifically states that "agencies should not limit themselves to calculating a proposed action's emissions as a percentage of sector, nationwide or global emissions in deciding whether or to what extent to consider climate change impacts under NEPA".

One of the goals of the proposed project is to consider impacts from climate change; particularly as it relates to sea-level rise and its impacts on the frequency and degree of flooding. As such, climate change is further discussed in Chapter 5 and the contribution of GHG emissions is acknowledged as a cumulative impact.

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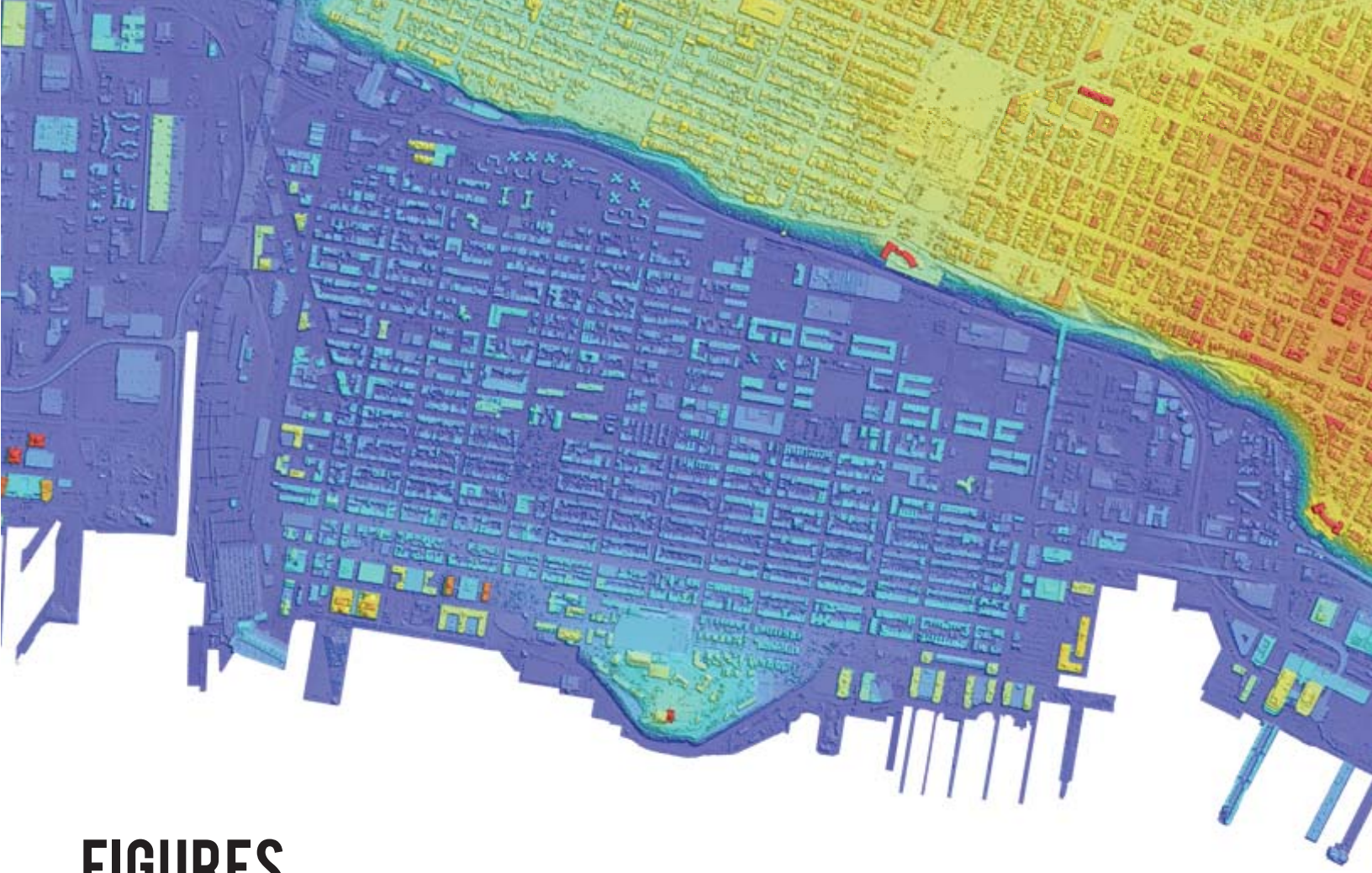
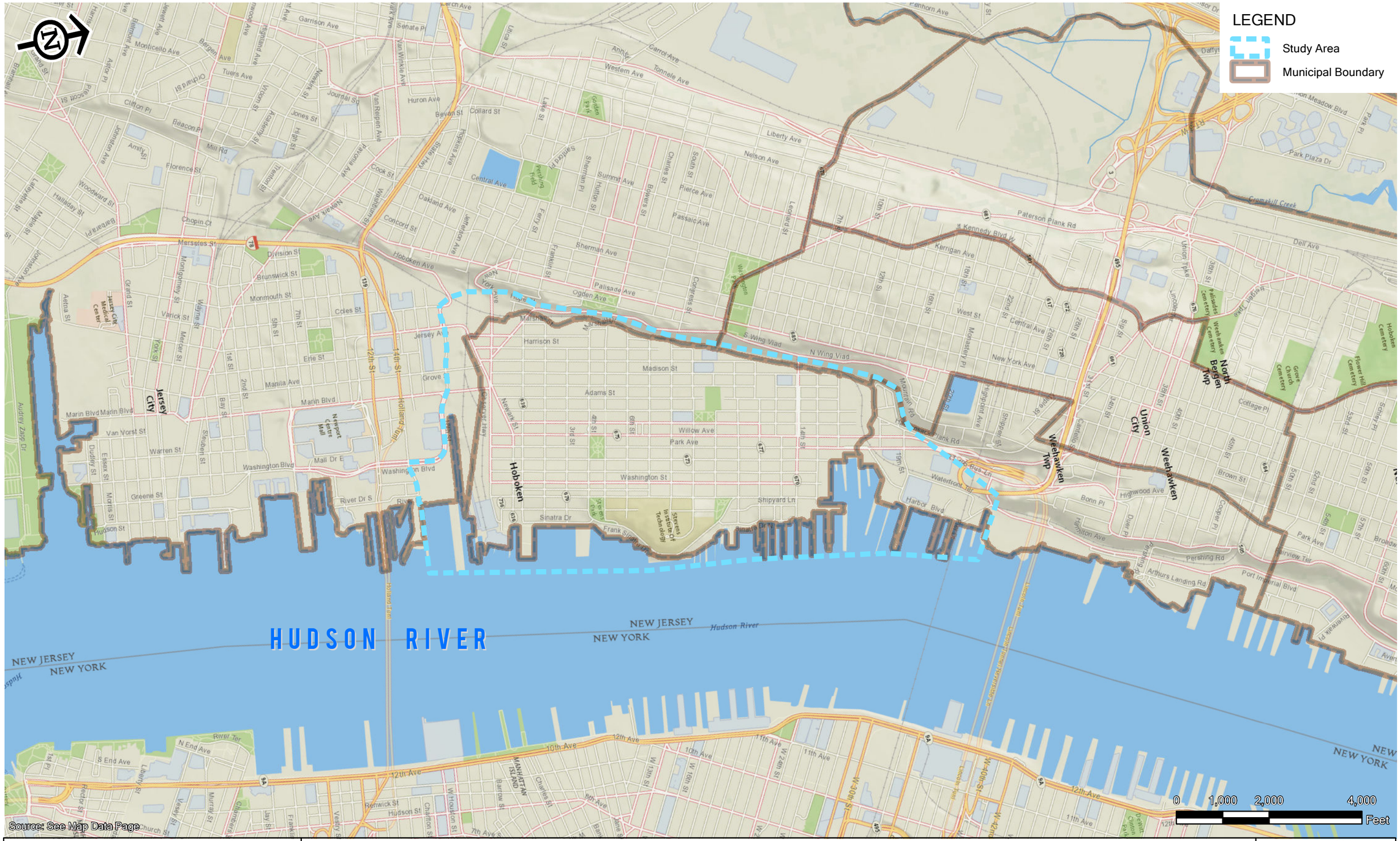
15.0 REFERENCES

Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews. Council on Environmental Quality. August 1, 2016

Using MOVES for Estimating State and Local Inventories of On-Road Greenhouse Gas Emissions and Energy Consumption, USEPA Transportation and Climate Division, Office of Transportation and Air Quality, EPA-420-B-12-068, November 2012.



FIGURES



REBUILD BY DESIGN HUDSON RIVER ▪ RESIST ▪ DELAY ▪ STORE ▪ DISCHARGE ▪

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Project Location Map

January 2017

FIGURE 1

Source: See Map Data Page

REBUILD BY DESIGN HUDSON RIVER ▪ RESIST ▪ DELAY ▪ STORE ▪ DISCHARGE ▪

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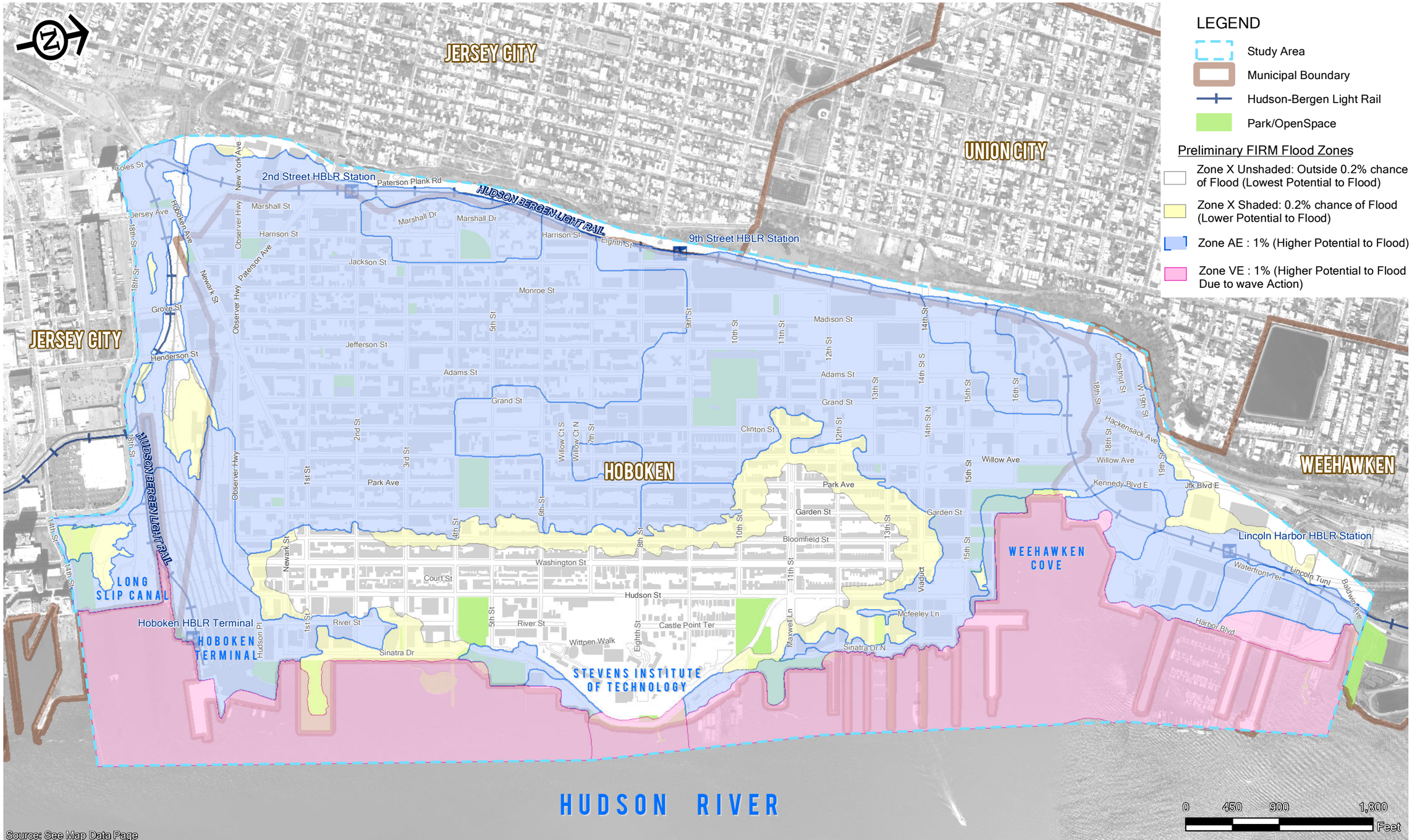
Study Area Map

January 2017

FIGURE 2



Source: See Map Data Page

REBUILD BY DESIGN HUDSON RIVER ▪ RESIST ▪ DELAY ▪ STORE ▪ DISCHARGE ▪

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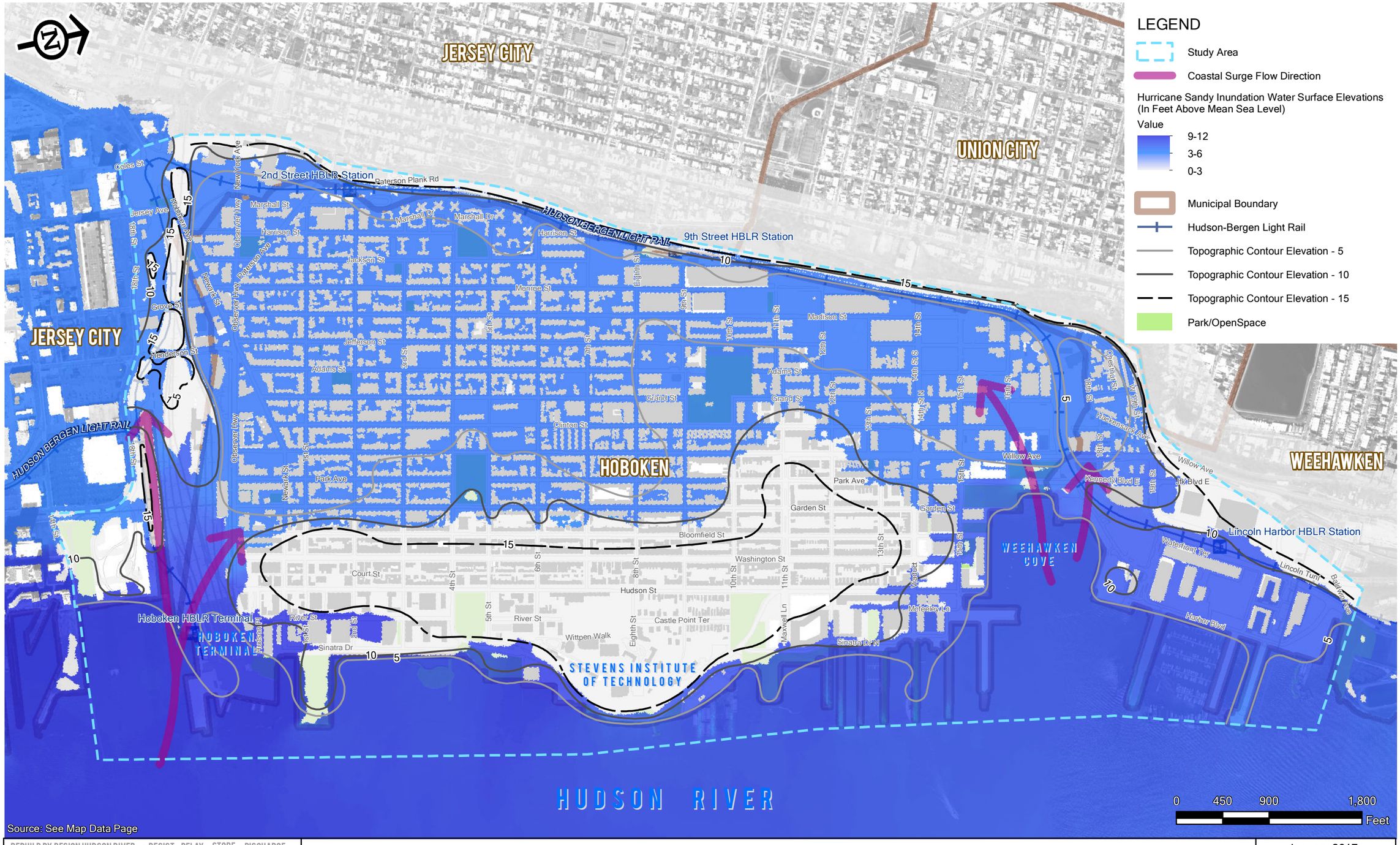
Preliminary FIRM Flood Zone Map

January 2017

FIGURE 3



Source: See Map Data Page

REBUILD BY DESIGN HUDSON RIVER ▪ RESIST ▪ DELAY ▪ STORE ▪ DISCHARGE ▪

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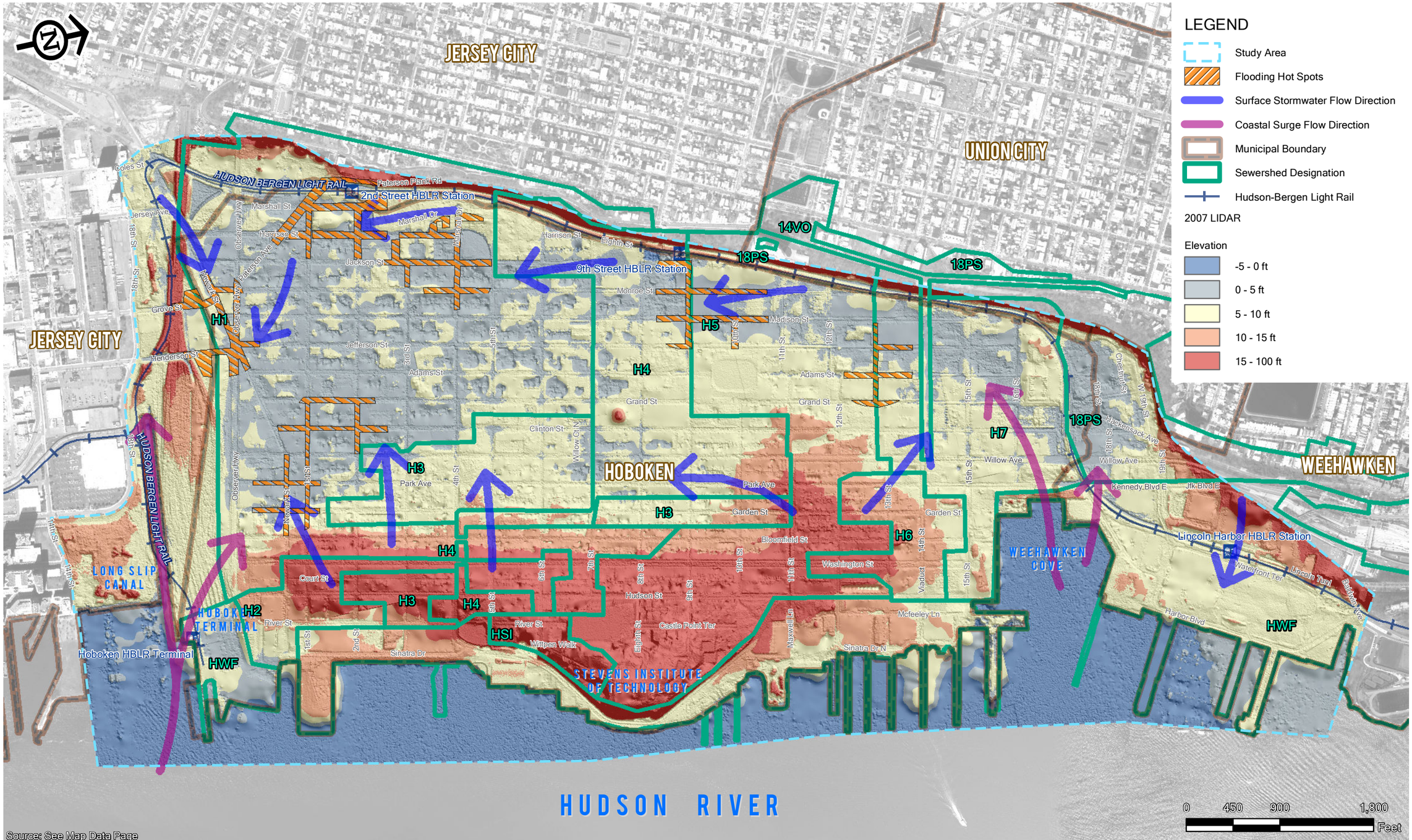
Study Area Inundation during Superstorm Sandy

January 2017

FIGURE 4



Source: See Map Data Page

REBUILD BY DESIGN HUDSON RIVER ▪ RESIST ▪ DELAY ▪ STORE ▪ DISCHARGE ▪

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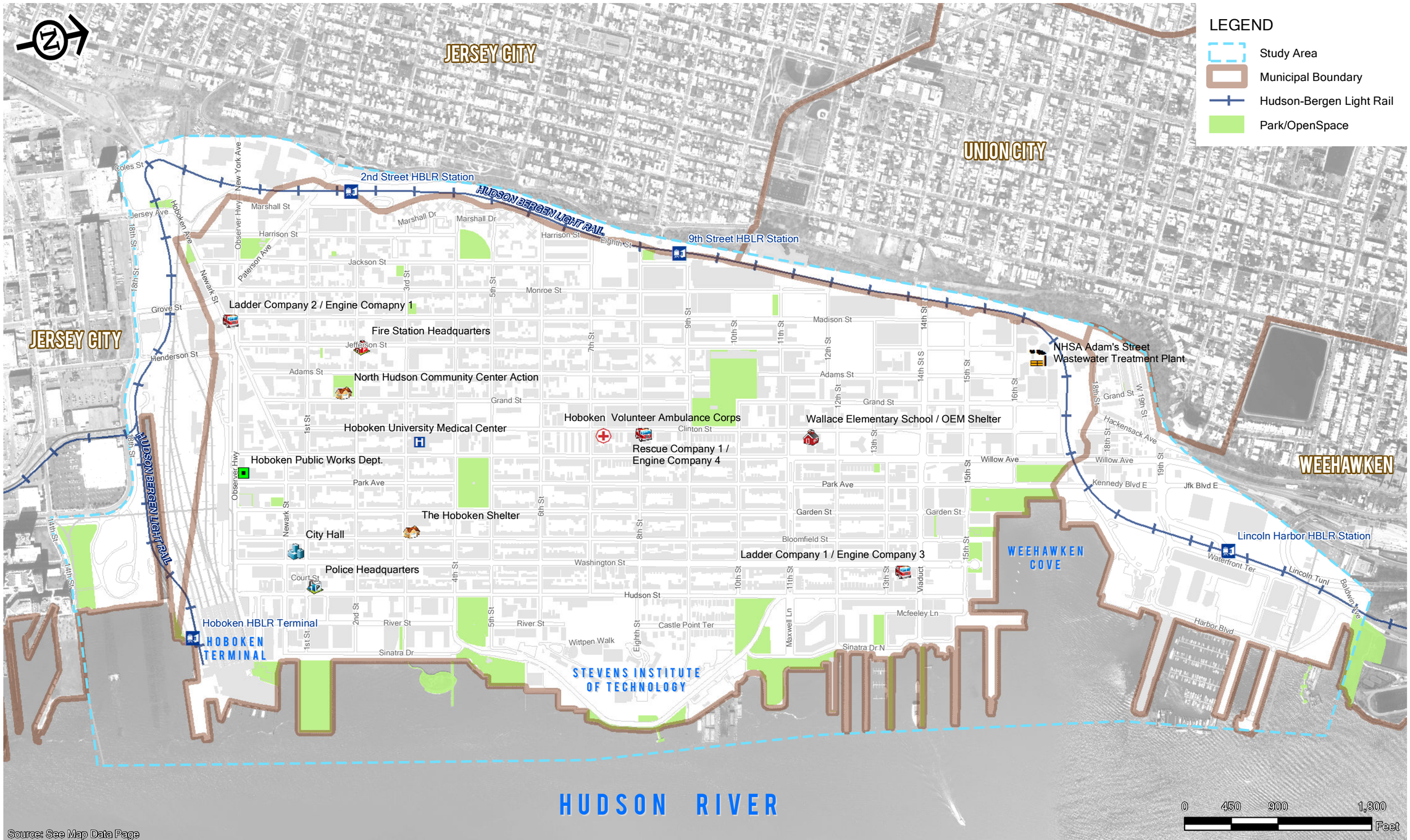
Topography / NHSA Sewershed / Flooding Hot Spots Map

January 2017

FIGURE 5



Source: See Map Data Page

REBUILD BY DESIGN HUDSON RIVER ▪ RESIST ▪ DELAY ▪ STORE ▪ DISCHARGE ▪

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Critical Infrastructure Map

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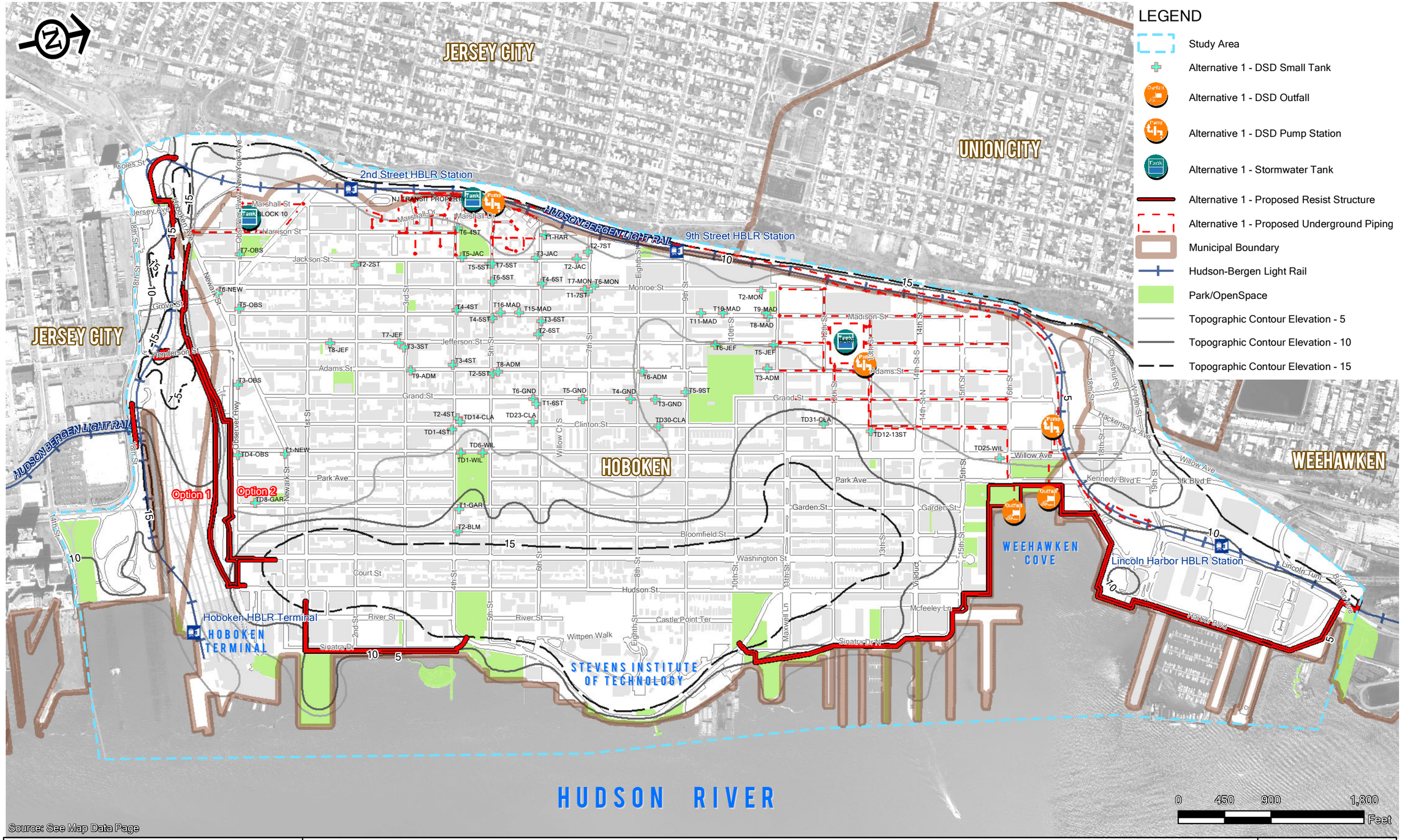
FIGURE 6



LEGEND

- Study Area
- Alternative 1 - DSD Small Tank
- Alternative 1 - DSD Outfall
- Alternative 1 - DSD Pump Station
- Alternative 1 - Stormwater Tank
- Alternative 1 - Proposed Resist Structure
- Alternative 1 - Proposed Underground Piping
- Municipal Boundary
- Hudson-Bergen Light Rail
- Park/OpenSpace
- Topographic Contour Elevation - 5
- Topographic Contour Elevation - 10
- Topographic Contour Elevation - 15

REBUILD BY DESIGN HUDSON RIVER ▪ RESIST ▪ DELAY ▪ STORE ▪ DISCHARGE ▪

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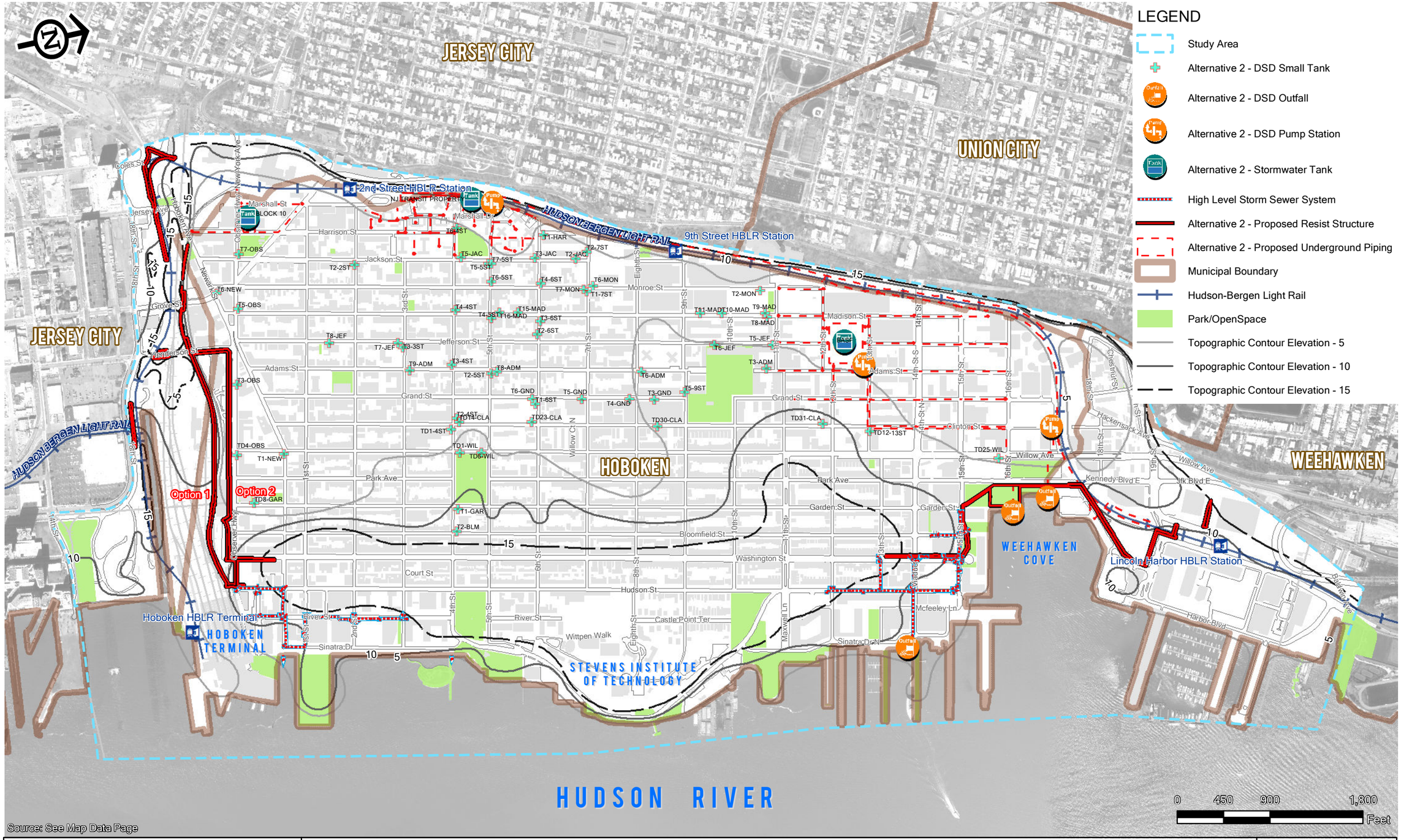
Alternative 1

January 2017

FIGURE 7



LEGEND

- Study Area
- Alternative 2 - DSD Small Tank
- Alternative 2 - DSD Outfall
- Alternative 2 - DSD Pump Station
- Alternative 2 - Stormwater Tank
- High Level Storm Sewer System
- Alternative 2 - Proposed Resist Structure
- Alternative 2 - Proposed Underground Piping
- Municipal Boundary
- Hudson-Bergen Light Rail
- Park/OpenSpace
- Topographic Contour Elevation - 5
- Topographic Contour Elevation - 10
- Topographic Contour Elevation - 15

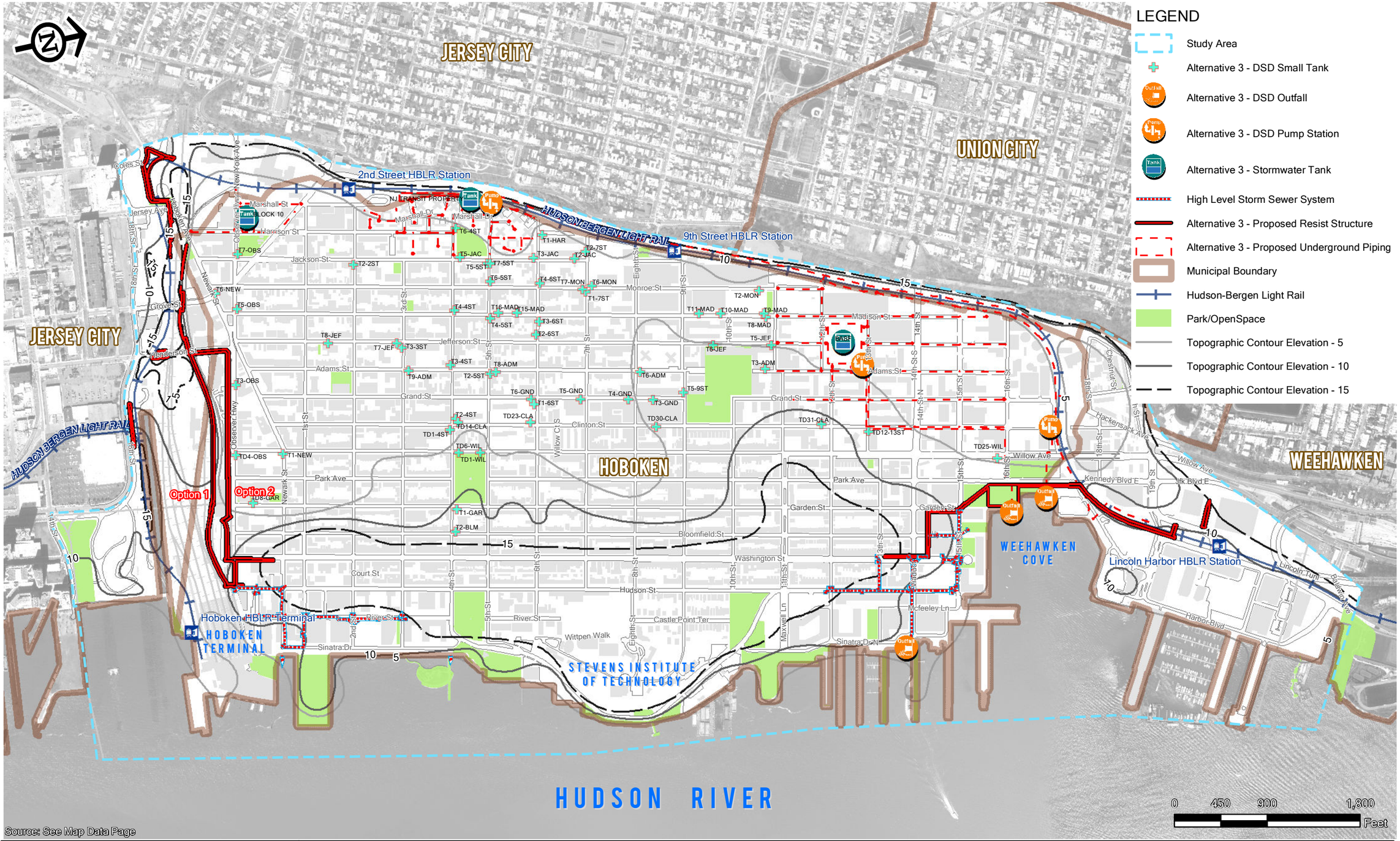
REBUILD BY DESIGN HUDSON RIVER ▪ RESIST ▪ DELAY ▪ STORE ▪ DISCHARGE ▪

Dewberry · State of New Jersey Department of Environmental Protection

Alternative 2

January 2017

FIGURE 8



Source: See Map Data Page

LEGEND

- Study Area
- Alternative 3 - DSD Small Tank
- Alternative 3 - DSD Outfall
- Alternative 3 - DSD Pump Station
- Alternative 3 - Stormwater Tank
- High Level Storm Sewer System
- Alternative 3 - Proposed Resist Structure
- Alternative 3 - Proposed Underground Piping
- Municipal Boundary
- Hudson-Bergen Light Rail
- Park/OpenSpace
- Topographic Contour Elevation - 5
- Topographic Contour Elevation - 10
- Topographic Contour Elevation - 15

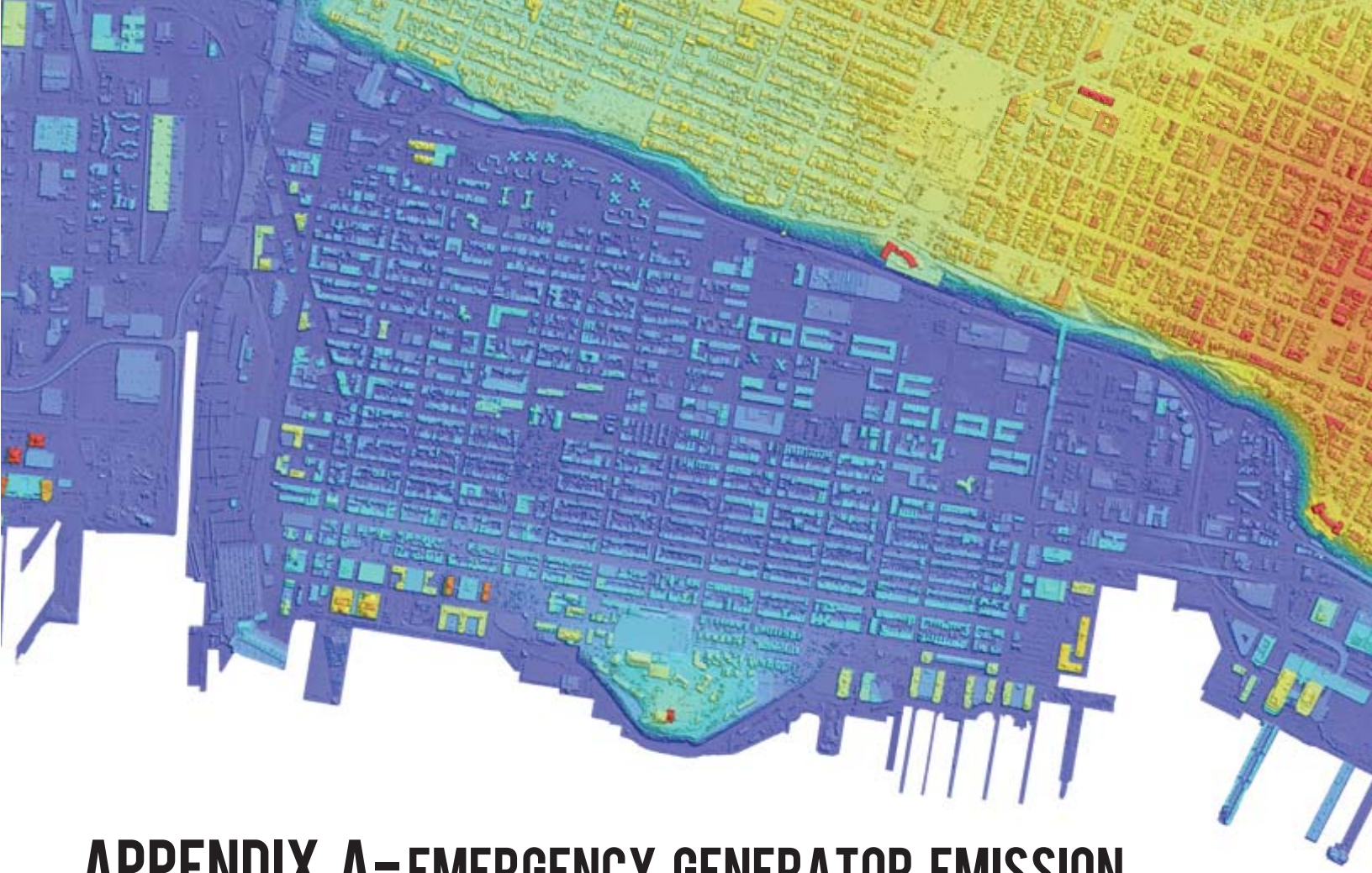
REBUILD BY DESIGN HUDSON RIVER ▪ RESIST ▪ DELAY ▪ STORE ▪ DISCHARGE ▪

Dewberry | State of New Jersey Department of Environmental Protection

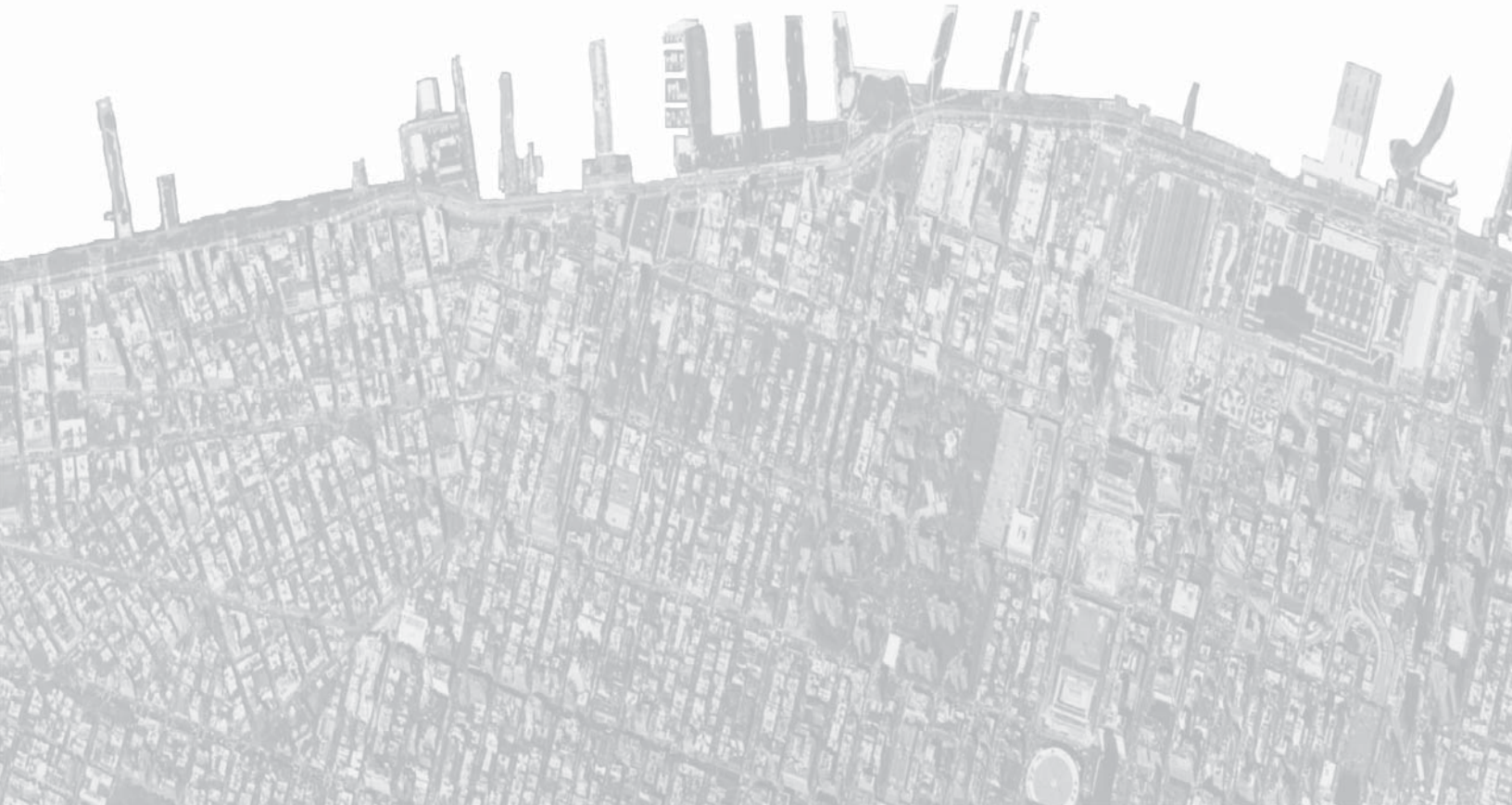
Alternative 3

January 2017

FIGURE 9



APPENDIX A-EMERGENCY GENERATOR EMISSION WORKSHEETS



Rebuild By Design: Resist, Delay, Store, Discharge Project

Air Quality Technical Environmental Study – Key Inputs

Operational Air Quality Assessment

2022 GENERATORS							
Equipment	Model	Usage Factor	Peak HP	Emission Factors (grams/brake-horsepower-hour)[1]			
				CO	NOx	PM2.5	VOC
Generator (60 kW)	Generac SD060	1.00	93	1.56394	2.79205	0.24976	0.35342
Generators (175 kW)	Generac SD175	1.00	267	0.60796	2.47029	0.11898	0.25945

[1] *MOVES run performed for all months in the year. Value shown is representative of the Emission Factor for the selected pollutant.*

2022 EMERGENCY GENERATOR EMISSION WORKSHEET

2022 HOBOKEN CO EMISSIONS WORKSHEET; Generators

2022

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Generator (60 kW)	727	582	582	582	727	582	582	727	582	727	582	582	7563
Generators (175 kW)	1623	1299	1299	1299	1623	1299	1299	1623	1299	1623	1299	1299	16882

TOTAL CO EMISSIONS FOR 2022	**24445**	**g/year**
	0.027	**tons/year**

2022 HOBOKEN NOx EMISSIONS WORKSHEET; Generators

2022

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Generator (60 kW)	1298	1039	1039	1039	1298	1039	1039	1298	1039	1298	1039	1039	13502
Generators (175 kW)	6596	5277	5277	5277	6596	5277	5277	6596	5277	6596	5277	5277	68595

TOTAL NOx EMISSIONS FOR 2022	**82097**	**g/year**
	0.090	**tons/year**

2022 HOBOKEN PM2.5 EMISSIONS WORKSHEET; Generators

2022

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Generator (60 kW)	116	93	93	93	116	93	93	116	93	116	93	93	1208
Generators (175 kW)	318	254	254	254	318	254	254	318	254	318	254	254	3304

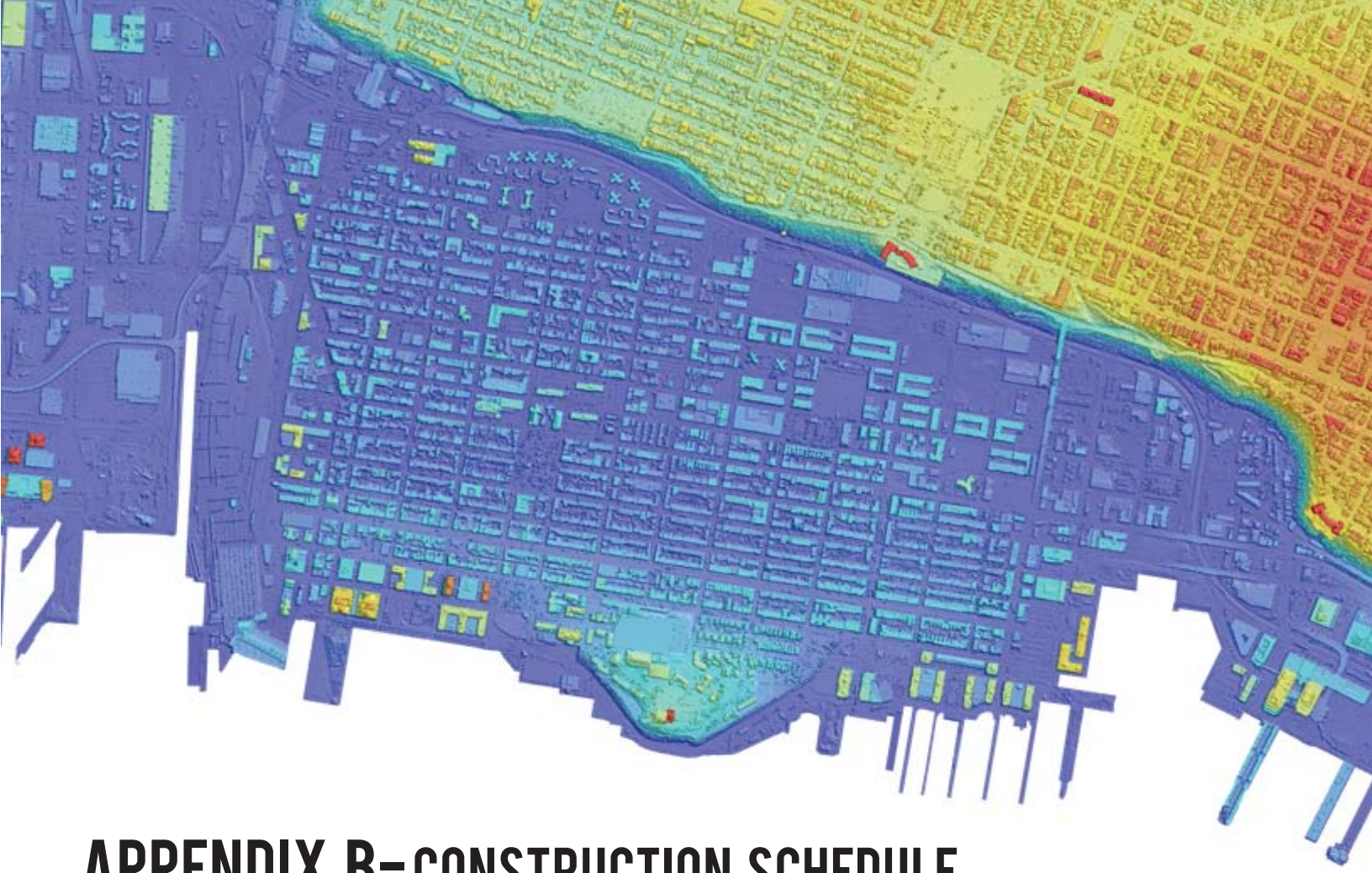
TOTAL PM2.5 EMISSIONS FOR 2022	**4512**	**g/year**
	0.005	**tons/year**

2022 HOBOKEN VOC EMISSIONS WORKSHEET; Generators

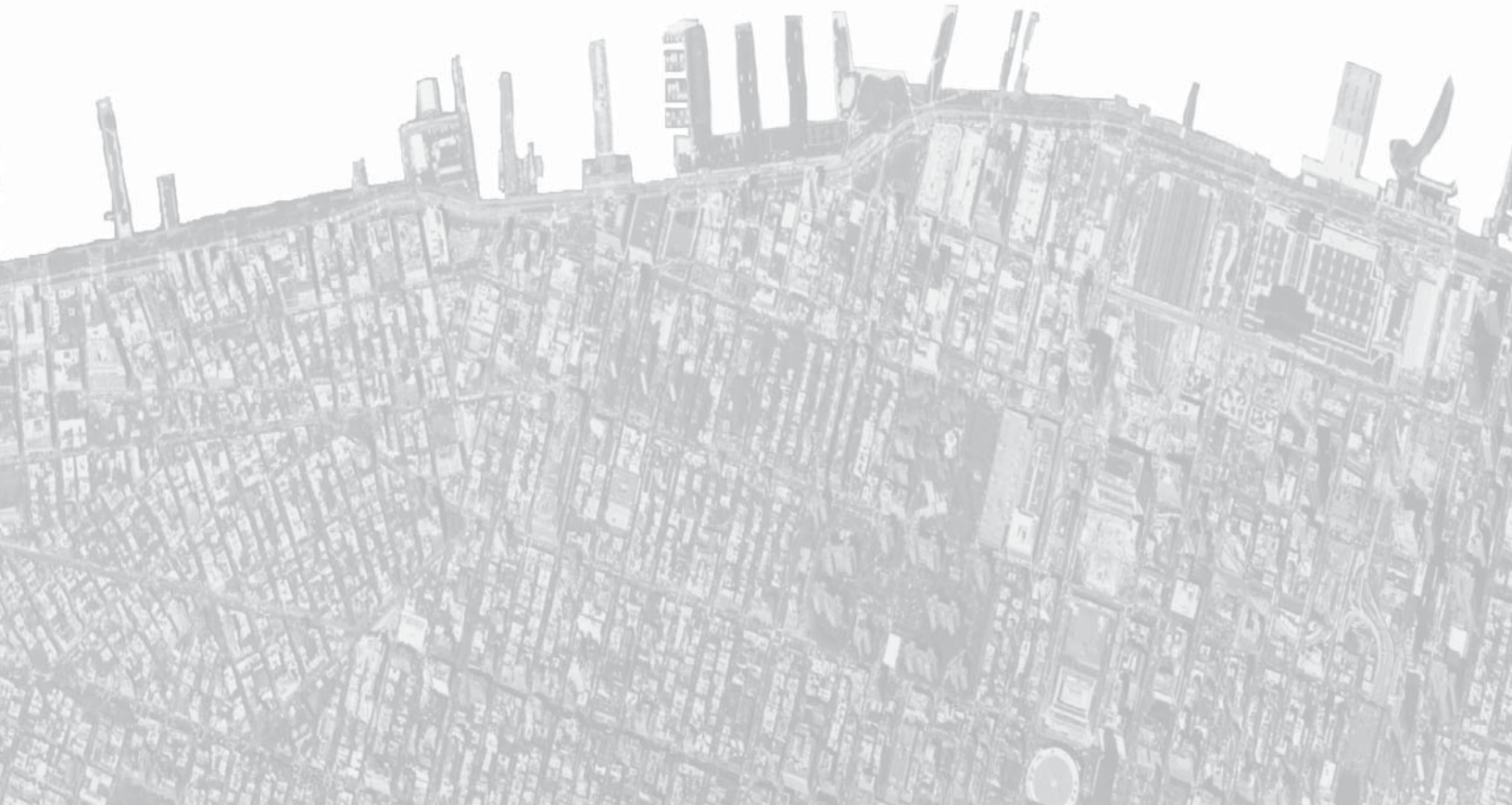
2022

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Generator (60 kW)	164	131	131	131	164	131	131	164	131	164	131	131	1709
Generators (175 kW)	693	554	554	554	693	554	554	693	554	693	554	554	7204

TOTAL VOC EMISSIONS FOR 2022	**8914**	**g/year**
	0.010	**tons/year**



APPENDIX B- CONSTRUCTION SCHEDULE



Construction Schedule - Alternate 1 Option 1

	2019 (13 months)													2020 (12 months)											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Production LF	0	0	0	120	300	300	300	300	300	300	300	120	80	80	80	140	300	300	300	300	300	300	300	120	120
South Location			0+00	1+20	4+20	7+20	10+20	13+20	16+20	19+20	22+20	23+40	24+20	25+00	25+80	27+20	30+20	33+20	36+20	39+20	42+20	45+20	48+20	49+40	50+60
Landmarks/Streets/Work Zones	Start to Jersey Ave							Jersey to Grove			Grove to Marin						Marin to Observer		Observer to Washington						
North Location			100+00	101+20	104+20	107+20	110+20	113+20	116+20	119+20	122+20	123+40	124+20	125+00	125+80	127+20	130+20	133+20	136+20	139+20	142+20	145+20	148+20	149+40	150+60
Landmarks/Streets/Work Zones	Frank Sinatra to 12th Street							12th Street to 14/15th Street			Tea Building										Weehawken Cove				
Alternate 1 Option 1 - Equipment/per work day																									
Excavator		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Dump Truck		3	3	3	6	6	6	6	6	6	6	2	2	1	1	1	4	4	6	6	6	6	6	2	2
Backhoe		6	6	6	6	6	6	6	6	6	3	3	3	3	3	3	6	6	6	6	6	6	6	6	3
Pile Driving Rig				2	2	2	2	2									2	2	2	2	2				
Sheet Pile Driving Rig				2	2	2	2	2									2	2	2	2	2				
Concrete Trucks Deliveries				8	8	8	8	8	8	8	8	2	2	2	2	2	8	8	8	8	8	8	2	2	2
Concrete Pump Truck				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Delivery Trucks per day (soil,rebar,piles)	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	2	2	3	3	3	3	1	1	1
Hydraulic Hoe ram					1	1	1	1	1	1	1					2	2	2	2						
250 Ton Crane										1										1			1		
Total Pieces of Equipment per month	2	13	13	26	30	30	30	30	26	26	22	11	11	10	10	12	29	29	32	31	30	26	19	14	11
Alternate 1 Option 1 -Crews/per work day																									
Earthworks Crew		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Rebar Iron Worker Crews		4	4	4	4	4	4	4	4	4	1	1	1	1	1	1	4	4	4	4	4	4	4	4	1
Carpenter/Concrete Crews		2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1
H-Pile driving Crew				2	2	2	2	2									2	2	2	2	2				
Sheet pile Driving Crew				2	2	2	2	2									2	2	2	2	2				
Landscape Crew																									
Steel Erectors Crews for gates									1	1	1	1	1					1	1	1	1	1	1		
Demolition Crew					1	1	1	1	1	1	1					2	2	2	2						
General Construction Crew	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Total No. Crews on Site per day	2	10	10	14	15	15	15	15	12	12	8	7	7	6	6	8	16	17	17	15	15	11	11	10	6

	2021 (12 Months)												2022 (7 months)									
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44			
	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22			
Production LF	80	80	80	140	300	300	300	300	300	300	300	120	120	80	80	280	280	280	220			
South Location	51+40	52+20	53+00	54+40	57+40	60+40	63+40	66+40	69+40	72+40	75+40	76+60	77+80	78+60	79+40	82+20						
Landmarks/Streets/Work Zones	Washington Street Work					Hudson To Frank Sinatra Dr																
North Location	151+40	152+20	153+00	154+40	157+40	160+40	163+40	166+40	169+40	172+40	175+40	176+60	177+80	178+60	179+40	182+20	185+00	187+80	190+00			
Landmarks/Streets/Work Zones	Weehawken Cove				Weehawken Waterfront								Harbor Blvd to Port Imperial Blvd to end							Total/month	Total/job	
Alternate 1 Option 1 - Equipment/per work day																						
Excavator	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	85	1700	Equipment-days
Dump Truck	1	1	2	4	6	6	6	6	6	6	4	4	2	2	2	2	2			162	3240	Equipment-days
Backhoe	3	3	3	3	5	5	5	5	5	5	4	4	3	3	3	3	3	2	3	193	3860	Equipment-days
Pile Driving Rig																				20	400	Equipment-days
Sheet Pile Driving Rig																				20	400	Equipment-days
Concrete Trucks Deliveries	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	158	3160	Equipment-days
Concrete Pump Truck	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	41	820	Equipment-days
Delivery Trucks per day (soil,rebar,piles)	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2			74	1480	Equipment-days
Hydraulic Hoe ram																				15	300	Equipment-days
250 Ton Crane				1			1				1								1	7	140	Equipment-days
Total Pieces of Equipment per month	10	10	12	15	18	18	19	18	18	18	16	14	11	11	11	11	11	5	8	775	15500	Equipment-days
Alternate 1 Option 1 -Crews/per work day																						
Earthworks Crew	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2			82	1640	Crew Days
Rebar Iron Worker Crews	1	1	1	1	3	3	3	3	3	3	2	2	1	1	1	1	1	1	1	108	2160	Crew Days
Carpenter/Concrete Crews	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			58	1160	Crew Days
H-Pile driving Crew																				20	400	Crew Days
Sheet pile Driving Crew																				20	400	Crew Days
Landscape Crew							1	1	1	1	1					1	1	1	2	10	200	Crew Days
Steel Erectors Crews for gates				1	1	1	1	1	1	1									1	19	380	Crew Days
Demolition Crew																				15	300	Crew Days
General Construction Crew	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	85	1700	Crew Days
Total No. Crews on Site per day	6	6	6	7	9	9	10	10	10	10	8	7	6	6	6	7	7	3	6	417	8340	Crew Days

Construction Schedule - Alternate 1 Option 2

	2019 (13 months)													2020 (12 months)											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Production LF	0	0	0	120	300	300	300	300	300	300	300	120	80	80	80	140	300	300	300	300	300	300	300	120	120
South Location			0+00	1+20	4+20	7+20	10+20	13+20	16+20	19+20	22+20	23+40	24+20	25+00	25+80	27+20	30+20	33+20	36+20	39+20	42+20	45+20	48+20	49+40	50+60
Landmarks/Streets/Work Zones	Start to Jersey Ave						Jersey to Grove				Grove to Marin						Marin to Observer		Observer to Washington						
North Location			100+00	101+20	104+20	107+20	110+20	113+20	116+20	119+20	122+20	123+40	124+20	125+00	125+80	127+20	130+20	133+20	136+20	139+20	142+20	145+20	148+20	149+40	150+60
Landmarks/Streets/Work Zones	Frank Sinatra to 12th Street							12th Street to 14/15th Street				Tea Building									Weehawken Cove				
Alternate 1 Option 2 - Equipment/per work day																									
Excavator		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Dump Truck		3	3	3	6	6	6	6	6	6	6	2	2	1	1	1	4	4	6	6	6	6	6	2	2
Backhoe		6	6	6	6	6	6	6	6	6	3	3	3	3	3	3	6	6	6	6	6	6	6	6	3
Pile Driving Rig				2	2	2	2	2									2	2	2	2	2				
Sheet Pile Driving Rig				2	2	2	2	2									2	2	2	2	2				
Concrete Trucks Deliveries				8	8	8	8	8	8	8	8	2	2	2	2	2	8	8	8	8	8	8	2	2	2
Concrete Pump Truck				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Delivery Trucks per day (soil,rebar,piles)	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	2	2	3	3	3	3	1	1	1
Hydraulic Hoe ram					1	1	1	1	1	1	1					2	2	2	2						
250 Ton Crane										1							1			1			1		
Total Pieces of Equipment Used daily ea. month	2	13	13	26	30	30	30	30	26	26	22	11	11	10	10	12	30	29	32	31	30	26	19	14	11
Alternate 1 Option 2 -Crews/per work day																									
Earthworks Crew		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Rebar Iron Worker Crews		4	4	4	4	4	4	4	4	4	1	1	1	1	1	1	4	4	4	4	4	4	4	4	1
Carpenter/Concrete Crews		2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1
H-Pile driving Crew				2	2	2	2	2									2	2	2	2	2				
Sheet pile Driving Crew				2	2	2	2	2									2	2	2	2	2				
Landscape Crew																									
Steel Erectors Crews for gates									1	1	1	1	1					1	1	1	1	1	1		
Demolition Crew					1	1	1	1	1	1	1					2	2	2	2						
General Construction Crew	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Total No. Crews on Site daily each month	2	10	10	14	15	15	15	15	12	12	8	7	7	6	6	8	16	17	17	15	15	11	11	10	6

	2021 (12 Months)												2022 (7 months)									
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45		
	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22		
Production LF	80	80	80	140	300	300	300	300	300	300	300	120	120	80	80	280	280	280	220			
South Location	51+40	52+20	53+00	54+40	57+40	60+40	63+40	66+40	69+40	72+40	75+40	76+60	77+80	78+60	79+40	82+20						
Landmarks/Streets/Work Zones	Washington Street Work					Hudson To Frank Sinatra Dr																
North Location	151+40	152+20	153+00	154+40	157+40	160+40	163+40	166+40	169+40	172+40	175+40	176+60	177+80	178+60	179+40	182+20	185+00	187+80	190+00			
Landmarks/Streets/Work Zones	Weehawken Cove				Weehawken Waterfront								Harbor Blvd to Port Imperial Blvd to end								Total/month	Total/job	
Alternate 1 Option 2 - Equipment/per work day																							
Excavator	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2		85	1700	Equipment-days
Dump Truck	1	1	2	4	6	6	6	6	6	6	4	4	2	2	2	2	2				162	3240	Equipment-days
Backhoe	3	3	3	3	5	5	5	5	5	5	4	4	3	3	3	3	3	2	2		192	3840	Equipment-days
Pile Driving Rig																					20	400	Equipment-days
Sheet Pile Driving Rig																					20	400	Equipment-days
Concrete Trucks Deliveries	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1		158	3160	Equipment-days
Concrete Pump Truck	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		41	820	Equipment-days
Delivery Trucks per day (soil,rebar,piles)	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2				74	1480	Equipment-days
Hydraulic Hoe ram																					15	300	Equipment-days
250 Ton Crane				1			1				1								1		8	160	Equipment-days
Total Pieces of Equipment Used daily ea. month	10	10	12	15	18	18	19	18	18	18	16	14	11	11	11	11	11	5	7	0	775	15500	Equipment-days
Alternate 1 Option 2 -Crews/per work day																							
Earthworks Crew	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2				82	1640	Crew Days
Rebar Iron Worker Crews	1	1	1	1	3	3	3	3	3	3	2	2	1	1	1	1	1	1	1		108	2160	Crew Days
Carpenter/Concrete Crews	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1				58	1160	Crew Days
H-Pile driving Crew																					20	400	Crew Days
Sheet pile Driving Crew																					20	400	Crew Days
Landscape Crew							1	1	1	1	1					1	1	1	2		10	200	Crew Days
Steel Erectors Crews for gates				1	1	1	1	1	1	1									1		19	380	Crew Days
Demolition Crew																					15	300	Crew Days
General Construction Crew	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2		85	1700	Crew Days
Total No. Crews on Site daily each month	6	6	6	7	9	9	10	10	10	10	8	7	6	6	6	7	7	3	6	0	417	8340	Crew Days

Construction Schedule - Alternate 2 Option 1

	2019 (13 months)													2020 (12 months)											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Production LF	0	0	0	120	240	240	240	240	240	240	240	120	40	80	80	120	240	240	240	240	240	240	240	120	40
South Location			0+00	1+20	3+60	6+00	8+40	10+80	13+20	15+60	18+00	19+20	19+60	20+40	21+20	22+40	24+80	27+20	29+60	32+00	34+40	36+80	39+20	40+40	40+80
Landmarks/Streets/Work Zones	Start to Jersey Ave							Jersey to Grove						Grove to Marin				Marin to Observer			Observer to Washington				
North Location														100+00	100+80	102+00	104+40	106+80	109+20	111+60	114+00	116+40	118+80	120+00	120+40
Landmarks/Streets/Work Zones														Washington Street				15th Street			Weehawken Cove				
Alternate 2 Option 1 - Equipment/per work day																									
Excavator		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Dump Truck		3	3	3	6	6	6	6	6	6	6	2	2	1	1	1	4	4	6	6	6	6	6	2	2
Backhoe		3	3	3	6	6	6	6	6	6	6	2	2	1	1	1	4	4	6	6	6	6	6	2	2
Pile Driving Rig				1	1	1	1	1					1	1	1	1	1								
Sheet Pile Driving Rig				1	1	1	1	1					1	1	1	1	1								
Concrete Trucks Deliveries				8	8	8	8	8	8	8	8	2	2	2	2	2	8	8	8	8	8	8	2	2	2
Concrete Pump Truck				1	1	1	1	1									1	1	1	1	1	1	1	1	1
Delivery Trucks per day (soil,rebar,piles)	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	1	1	1
Hydraulic Hoe ram						1								1											1
250 Ton Crane										1										1			1		
Total Pieces of Equipment per month	2	10	10	20	26	27	26	26	23	24	23	9	11	10	9	9	23	21	25	26	25	25	19	10	11
Alternate 2 Option 1 -Crews/per work day																									
Earthworks Crew		2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	2	2	2	2	2	2	2	2	2
Rebar Iron Worker Crews		2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	2	2	2	2	2	2	2	2	1
Carpenter/Concrete Crews		2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1
H-Pile driving Crew				1	1	1	1	1					1	1	1	1	1								
Sheet pile Driving Crew				1	1	1	1	1					1	1	1	1	1								
Landscape Crew																									
Steel Erectors Crews for gates							1	1	1	1							1	1	1	1	1	1	1		
Demolition Crew						1								1											1
General Construction Crew	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2
Total No. Crews on Site per day	1	7	7	9	9	10	10	10	8	8	6	5	7	8	7	7	11	9	9	9	9	9	9	8	7

	2021 (12 Months)												2022 (7 months)										
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45			
	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22			
Production LF	80	80	80	120	240	240	240	240	240	240	240	120	40	80	80	200	150						
South Location	41+60	42+40	43+20	44+40	46+80	49+20	51+60	54+00	56+40	58+80													
Landmarks/Streets/Work Zones	Observer to Washington						Washington Street Work																
North Location	121+20	122+00	122+80	124+00	126+40	128+80	131+20	133+60	136+00	138+40	140+80	142+00	142+40	143+20	144+00	146+00	147+50						
Landmarks/Streets/Work Zones	Weehawken Cove			Harbor Blvd					19th Street to end												Total/month	Total/job	
Alternate 2 Option 1 - Equipment/per work day																							
Excavator	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2		84	1680	Equipment-days
Dump Truck	1	1	2	4	6	6	6	6	6	6	4	4	2	2	2	2	2				162	3240	Equipment-days
Backhoe	1	1	2	4	6	6	6	6	6	6	4	4	2	2	2	2	2	2	1		165	3300	Equipment-days
Pile Driving Rig																					10	200	Equipment-days
Sheet Pile Driving Rig																					10	200	Equipment-days
Concrete Trucks Deliveries	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1		158	3160	Equipment-days
Concrete Pump Truck	1	1	1				1	1	1	1	1	1	1	1	1	1	1				28	560	Equipment-days
Delivery Trucks per day (soil,rebar,piles)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1				49	980	Equipment-days
Hydraulic Hoe ram																					3	60	Equipment-days
250 Ton Crane							1										1				5	100	Equipment-days
Total Pieces of Equipment per month	8	8	10	13	17	17	19	18	18	18	14	13	8	8	9	9	10	5	4		674	13480	Equipment-days
Alternate 2 Option 1 -Crews/per work day																							
Earthworks Crew	1	1	1	2	2	2	2	2	2	2	2	2	1	1	1	2	2				72	1440	Crew Days
Rebar Iron Worker Crews	1	1	1	1	2	2	2	2	2	2	1	1	1	1	1	1	1				65	1300	Crew Days
Carpenter/Concrete Crews	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1				58	1160	Crew Days
H-Pile driving Crew																					10	200	Crew Days
Sheet pile Driving Crew																					10	200	Crew Days
Landscape Crew							1	1	1	1	1					1	1				7	140	Crew Days
Steel Erectors Crews for gates				1	1	1	1										1				16	320	Crew Days
Demolition Crew																					3	60	Crew Days
General Construction Crew	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1		67	1340	Crew Days
Total No. Crews on Site per day	5	5	5	7	8	8	9	8	8	8	7	5	4	4	4	6	7	1	1		308	6160	Crew Days

Construction Schedule - Alternate 2 Option 2

	2019 (13 months)													2020 (12 months)											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Production LF	0	0	0	120	240	240	240	240	240	240	240	120	40	80	80	120	240	240	240	240	240	240	240	120	40
South Location			0+00	1+20	3+60	6+00	8+40	10+80	13+20	15+60	18+00	19+20	19+60	20+40	21+20	22+40	24+80	27+20	29+60	32+00	34+40	36+80	39+20	40+40	40+80
Landmarks/Streets/Work Zones	Start to Jersey Ave							Jersey to Grove						Grove to Marin				Marin to Observer			Observer to Washington				
North Location														100+00	100+80	102+00	104+40	106+80	109+20	111+60	114+00	116+40	118+80	120+00	120+40
Landmarks/Streets/Work Zones														Washington Street				15th Street			Weehawken Cove				
Alternate 2 Option 2- Equipment/per work day																									
Excavator		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Dump Truck		1	3	3	4	6	6	6	6	6	6	2	2	2	2	2	3	3	6	6	6	6	6	1	1
Backhoe		1	3	3	4	6	6	6	6	6	6	2	2	2	2	2	3	3	6	6	6	6	6	1	1
Pile Driving Rig				1	1	1	1	1	1				1	1	1	1	1	1							
Sheet Pile Driving Rig				1	1	1	1	1	1				1	1	1	1	1	1							
Concrete Trucks Deliveries				4	4	4	4	4	3	3	3	2	2	2	2	2	6	6	6	6	6	6	6	6	6
Concrete Pump Truck				1	1	1	1	1									1	1	1	1	1	1	1	1	1
Delivery Trucks per day (soil,rebar,piles)	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	2	2	2	2	2	2	1	1	1
Hydraulic Hoe ram						1								1											1
250 Ton Crane										1										1			1		
Total Pieces of Equipment per month	2	6	10	17	19	24	23	23	21	19	18	9	11	12	11	11	19	19	23	24	23	23	23	12	13
Alternate 2 Option 2 -Crews/per work day																									
Earthworks Crew		2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	2	2	2	2	2	2	2	2	2
Rebar Iron Worker Crews		2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	2	2	2	2	2	2	2	2	1
Carpenter/Concrete Crews		2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1
H-Pile driving Crew				1	1	1	1	1					1	1	1	1	1								
Sheet pile Driving Crew				1	1	1	1	1					1	1	1	1	1								
Landscape Crew																									
Steel Erectors Crews for gates							1	1	1	1							1	1	1	1	1	1	1		
Demolition Crew						1								1											1
General Construction Crew	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2
Total No. Crews on Site per day	1	7	7	9	9	10	10	10	8	8	6	5	7	8	7	7	11	9	9	9	9	9	9	8	7

	2021 (12 Months)												2022 (7 months)										
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45			
	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22			
Production LF	80	80	80	120	240	240	240	240	240	240	240	120	40	80	80	200	150						
South Location	41+60	42+40	43+20	44+40	46+80	49+20	51+60	54+00	56+40	58+80													
Landmarks/Streets/Work Zones	Observer to Washington						Washington Street Work																
North Location	121+20	122+00	122+80	124+00	126+40	128+80	131+20	133+60	136+00	138+40	140+80	142+00	142+40	143+20	144+00	146+00	147+50						
Landmarks/Streets/Work Zones	Weehawken Cove			Harbor Blvd					19th Street to end												Total/month	Total/job	
Alternate 2 Option 2- Equipment/per work day																							
Excavator	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2		84	1680	Equipment-days
Dump Truck	1	1	1	1	6	6	6	6	6	6	2	2	2	2	2	2	2				149	2980	Equipment-days
Backhoe	1	1	1	1	6	6	6	6	6	6	2	2	2	2	2	2	2	2	1		152	3040	Equipment-days
Pile Driving Rig																					12	240	Equipment-days
Sheet Pile Driving Rig																					12	240	Equipment-days
Concrete Trucks Deliveries	2	2	2	2	2	2	4	4	4	4	4	4	3	3	3	3	3	2	2		148	2960	Equipment-days
Concrete Pump Truck	1	1	1				1	1	1	1	1	1	1	1	1	1	1				28	560	Equipment-days
Delivery Trucks per day (soil,rebar,piles)	1	1	2	2	2	2	2	2	1	1	1	1	1	1	1	2	2				63	1260	Equipment-days
Hydraulic Hoe ram																					3	60	Equipment-days
250 Ton Crane							1										1				5	100	Equipment-days
Total Pieces of Equipment per month	8	8	9	8	18	18	22	21	20	20	12	12	10	10	11	12	13	6	5		656	13120	Equipment-days
Alternate 2 Option 2 -Crews/per work day																							
Earthworks Crew	1	1	1	2	2	2	2	2	2	2	2	2	1	1	1	2	2				72	1440	Crew Days
Rebar Iron Worker Crews	1	1	1	1	2	2	2	2	2	2	1	1	1	1	1	1	1				65	1300	Crew Days
Carpenter/Concrete Crews	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1				58	1160	Crew Days
H-Pile driving Crew																					10	200	Crew Days
Sheet pile Driving Crew																					10	200	Crew Days
Landscape Crew							1	1	1	1	1					1	1				7	140	Crew Days
Steel Erectors Crews for gates				1	1	1	1										1				16	320	Crew Days
Demolition Crew																					3	60	Crew Days
General Construction Crew	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1		67	1340	Crew Days
Total No. Crews on Site per day	5	5	5	7	8	8	9	8	8	8	7	5	4	4	4	6	7	1	1		308	6160	Crew Days

Construction Schedule - Alternate 3 Option 1

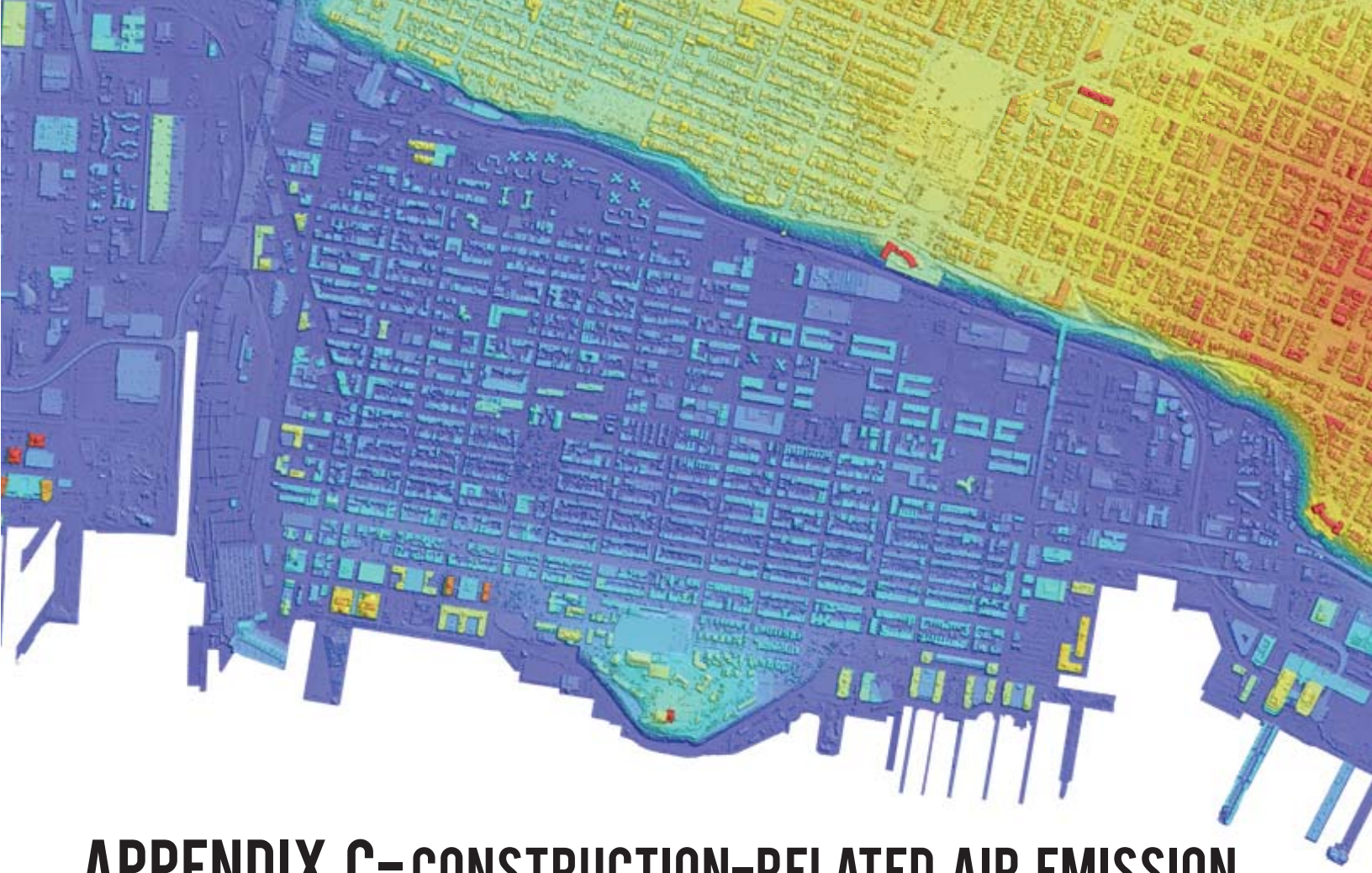
	2019 (13 months)													2020 (12 months)										
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Production LF	0	0	0	120	240	240	240	240	240	240	240	120	40	80	80	120	240	240	240	240	240	240	240	120	40
South Location			0+00	1+20	3+60	6+00	8+40	10+80	13+20	15+60	18+00	19+20	19+60	20+40	21+20	22+40	24+80	27+20	29+60	32+00	34+40	36+80	39+20	40+40	40+80
Landmarks/Streets/Work Zones	Start to Jersey Ave							Jersey to Grove						Grove to Marin				Marin to Observer		Observer to Washington					
North Location														100+00	100+80	102+00	104+40	106+80	109+20	111+60	114+00	116+40	118+80	120+00	120+40
Landmarks/Streets/Work Zones														Washington Street				Alleyway to Harborside Park				Weehawken Cove			
Alternate 3 Option 1 - Equipment/per work day																									
Excavator	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Dump Truck		1	4	4	5	4	4	4	4	4	4	2	2	1	1	1	2	2	4	4	4	4	4	1	1
Backhoe		1	4	4	5	4	4	4	4	4	4	2	2	1	1	1	2	2	4	4	4	4	4	1	1
Pile Driving Rig				1	1	1								1	1	1	1	1	1						
Sheet Pile Driving Rig				1	1	1								1	1	1	1	1	1						
Concrete Trucks Deliveries				3	3	3	3	3	3	2	1	1	1	1	1	2	3	3	4	4	4	4	4	4	3
Concrete Pump Truck				1	1	1	1	1						1		1	1		1		1		1		1
Delivery Trucks per day (soil,rebar,piles)			1	1	1		1	1		1	1	1	1	1	1	1	1	1	1	2	2	2	2	1	1
Hydraulic Hoe ram						1								1											1
250 Ton Crane										1										1			1		
Total Pieces of Equipment per month	1	3	10	16	18	16	14	14	12	13	11	7	7	9	7	9	12	11	17	16	16	15	17	8	9
Alternate 3 Option 1 -Crews/per work day																									
Earthworks Crew		2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	2	2	2	2	2	2	2	2	2
Rebar Iron Worker Crews		2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	2	2	2	2	2	2	2	2	1
Carpenter/Concrete Crews		1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2
H-Pile driving Crew				1	1	1									1	1	1	1							
Sheet pile Driving Crew				1	1	1									1	1	1								
Landscape Crew																									
Steel Erectors Crews for gates							1	1	1	1									1	1	1	1	1		
Demolition Crew						1								1											1
General Construction Crew	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2
Total No. Crews on Site per day	1	6	6	8	8	9	7	7	7	7	6	5	5	7	8	8	10	9	9	9	9	9	9	8	8

	2021 (12 Months)												2022 (7 months)										
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45			
	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22			
Production LF	80	80	80	120	240	240	240	240	240	150	150	120	40	80	80								
South Location	41+60	42+40	43+20	44+40	46+80	49+20	51+60	54+00	56+40	57+90													
Landmarks/Streets/Work Zones	Observer to Washington						Washington Street Work																
North Location	121+20	122+00	122+80	124+00	126+40	128+80	131+20	133+60	136+00	137+50	139+00	140+20	140+60	141+40	142+20								
Landmarks/Streets/Work Zones	Weehawken Cove			NJ Transit/Hartz Mountain Property					19th Street to end												Total/month	Total/job	
Alternate 3 Option 1 - Equipment/per work day																							
Excavator	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			42	840	Equipment-days
Dump Truck	1	1	1	4	4	4	4	4	4	4	3	3	2	2	2	2	2				118	2360	Equipment-days
Backhoe	1	1	1	4	4	4	4	4	4	4	3	3	2	1	1	1	1	1			115	2300	Equipment-days
Pile Driving Rig																					9	180	Equipment-days
Sheet Pile Driving Rig																					9	180	Equipment-days
Concrete Trucks Deliveries	1	1	1	3	4	5	4	4	4	3	2	2	2	2	2						100	2000	Equipment-days
Concrete Pump Truck		1	1				1		1		1	1	1		1						20	400	Equipment-days
Delivery Trucks per day (soil,rebar,piles)	1	1	1	1	1	1	2	2	2	2	2	1	1		1						44	880	Equipment-days
Hydraulic Hoe ram																					3	60	Equipment-days
250 Ton Crane							1								1						5	100	Equipment-days
Total Pieces of Equipment per month	5	6	6	13	14	15	17	15	16	14	12	11	9	6	9	4	4	2	0	0	465	9300	Equipment-days
Alternate 3 Option 1 -Crews/per work day																							
Earthworks Crew	1	1	1	2	2	2	2	2	2	2	2	2	1	1	1						68	1360	Crew Days
Rebar Iron Worker Crews	1	1	1	1	2	2	2	2	2	2	1	1	1	1	1						63	1260	Crew Days
Carpenter/Concrete Crews	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1						61	1220	Crew Days
H-Pile driving Crew																					7	140	Crew Days
Sheet pile Driving Crew																					6	120	Crew Days
Landscape Crew							1	1	1	1	1		1	1	1						8	160	Crew Days
Steel Erectors Crews for gates				1	1	1	1								1						14	280	Crew Days
Demolition Crew																					3	60	Crew Days
General Construction Crew	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1			66	1320	Crew Days
Total No. Crews on Site per day	6	6	6	8	9	9	10	9	9	9	7	5	5	5	6	1	1	1	0	0	296	5920	Crew Days

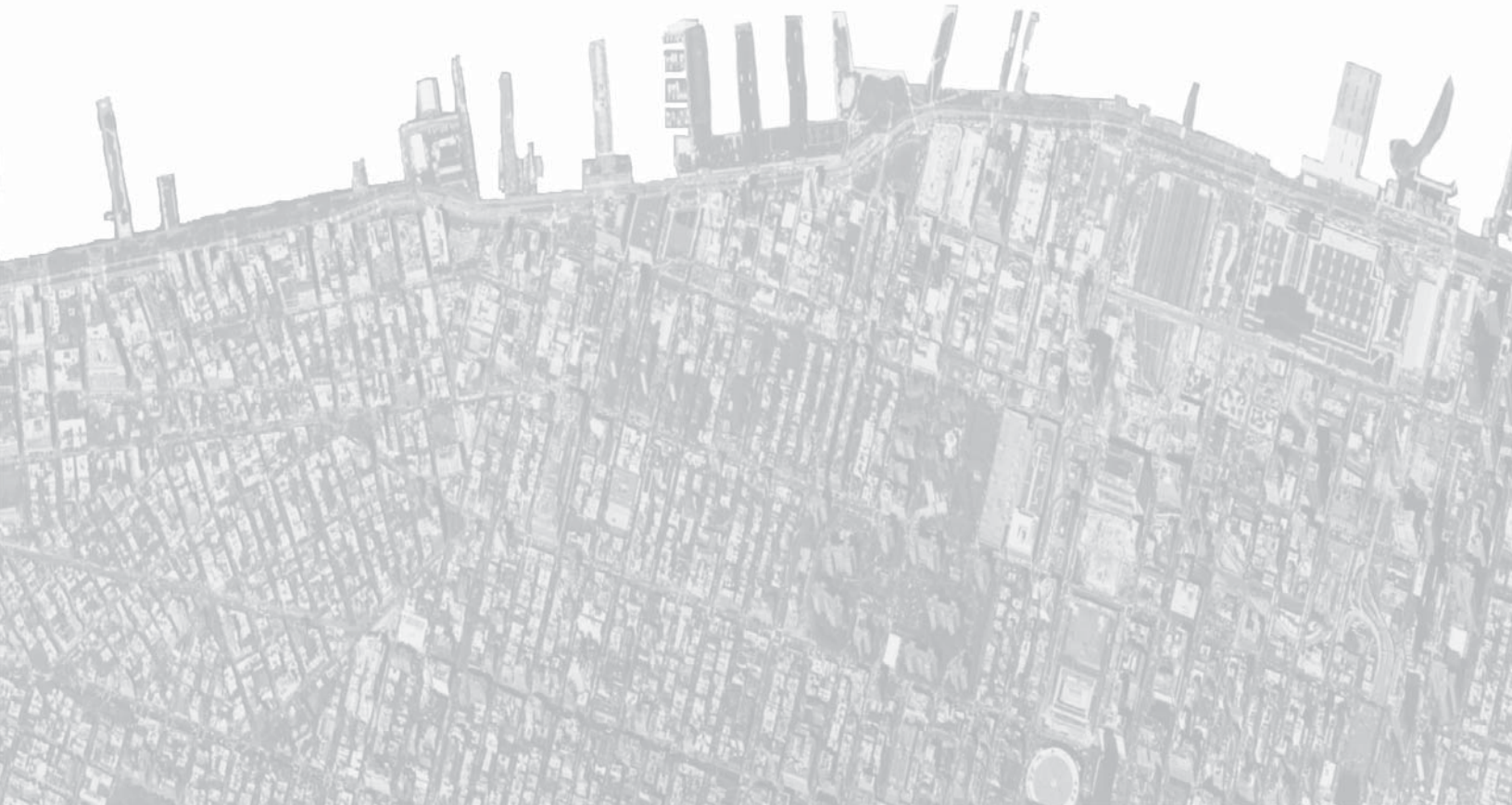
Construction Schedule - Alternate 3 Option 2

	2019 (13 months)													2020 (12 months)										
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Production LF	0	0	0	120	240	240	240	240	240	240	240	120	40	80	80	120	240	240	240	240	240	240	240	120	40
South Location			0+00	1+20	3+60	6+00	8+40	10+80	13+20	15+60	18+00	19+20	19+60	20+40	21+20	22+40	24+80	27+20	29+60	32+00	34+40	36+80	39+20	40+40	40+80
Landmarks/Streets/Work Zones	Start to Jersey Ave							Jersey to Grove						Grove to Marin				Marin to Observer		Observer to Washington					
North Location														100+00	100+80	102+00	104+40	106+80	109+20	111+60	114+00	116+40	118+80	120+00	120+40
Landmarks/Streets/Work Zones														Washington Street				Alleyway to Harborside Park				Weehawken Cove			
Alternate 3 Option 2 - Equipment/per work day																									
Excavator		1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Dump Truck		1	4	4	5	4	4	4	4	4	4	2	2	3	3	3	3	2	4	4	4	4	4	1	1
Backhoe		1	4	4	5	4	4	4	4	4	4	2	2	3	3	3	3	2	4	4	4	4	4	1	1
Pile Driving Rig				1	1	1	1								1	1	1	1	1						
Sheet Plie Driving Rig				1	1	1	1								1	1	1	1	1						
Concrete Trucks Deliveries				3	3	3	3	3	3	2	1	1	1	1	1	2	4	4	5	4	4	4	4	4	3
Concrete Pump Truck				1	1	1	1	1						1		1	1		1		1		1		1
Delivery Trucks per day (soil,rebar,piles)			1	1	1		1	1		1	1	1	1	1	1	1	1	1	1	2	2	2	2	1	1
Hydraulic Hoe ram						1								1											1
250 Ton Crane										1										1			1		
Total Pieces of Equipment per month	0	3	10	16	18	16	17	15	13	14	12	8	8	12	12	14	16	13	19	17	17	16	18	9	10
Alternate 3 Option 2 -Crews/per work day																									
Earthworks Crew		2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	2	2	2	2	2	2	2	2	2
Rebar Iron Worker Crews		2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	2	2	2	2	2	2	2	2	1
Carpenter/Concrete Crews		1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2
H-Pile driving Crew				1	1	1	1								1	1	1	1	1						
Sheet pile Driving Crew				1	1	1									1	1	1	1	1						
Landscape Crew																									
Steel Erectors Crews for gates							1	1	1	1							1	1	1	1	1	1	1		
Demolition Crew						1								1											1
General Construction Crew	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	1	1	1	1	1	2	2	2
Total No. Crews on Site per day	1	6	6	8	8	9	8	7	7	7	6	5	5	7	8	8	11	10	10	8	8	8	9	8	8

	2021 (12 Months)												2022 (7 months)										
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45			
	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22			
Production LF	80	80	80	120	240	240	240	240	240	150	150	120	40	80	80								
South Location	41+60	42+40	43+20	44+40	46+80	49+20	51+60	54+00	56+40	57+90													
Landmarks/Streets/Work Zones	Observer to Washington						Washington Street Work																
North Location	121+20	122+00	122+80	124+00	126+40	128+80	131+20	133+60	136+00	137+50	139+00	140+20	140+60	141+40	142+20								
Landmarks/Streets/Work Zones	Weehawken Cove			NJ Transit/Hartz Mountain Property					19th Street to end												Total/month	Total/job	
Alternate 3 Option 2 - Equipment/per work day																							
Excavator	2	2	1	1	1	1	2	2	2	2	2	2	1	1	2	2	2	2	2		75	1500	Equipment-days
Dump Truck	1	1	1	4	4	4	4	4	4	4	3	3	2	2	2	2	2				125	2500	Equipment-days
Backhoe	1	1	1	4	4	4	4	4	4	4	3	3	2	1	1	1	1	1			122	2440	Equipment-days
Pile Driving Rig																					9	180	Equipment-days
Sheet Plie Driving Rig																					9	180	Equipment-days
Concrete Trucks Deliveries	1	1	1	3	4	5	4	4	4	3	2	2	2	2	2						103	2060	Equipment-days
Concrete Pump Truck		1	1				1		1		1	1	1		1						20	400	Equipment-days
Delivery Trucks per day (soil,rebar,piles)	1	1	1	1	1	1	2	2	2	2	2	1	1		1						44	880	Equipment-days
Hydraulic Hoe ram																					3	60	Equipment-days
250 Ton Crane							1								1						5	100	Equipment-days
Total Pieces of Equipment per month	6	7	6	13	14	15	18	16	17	15	13	12	9	6	10	5	5	3	2		515	10300	Equipment-days
Alternate 3 Option 2 -Crews/per work day																							
Earthworks Crew	1	1	1	2	2	2	2	2	2	2	2	2	1	1	1						68	1360	Crew Days
Rebar Iron Worker Crews	1	1	1	1	2	2	2	2	2	2	1	1	1	1	1						63	1260	Crew Days
Carpenter/Concrete Crews	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1						61	1220	Crew Days
H-Pile driving Crew																					9	180	Crew Days
Sheet pile Driving Crew																					8	160	Crew Days
Landscape Crew							1	1	1	1	1		1	1	1						8	160	Crew Days
Steel Erectors Crews for gates				1	1	1	1								1						16	320	Crew Days
Demolition Crew																					3	60	Crew Days
General Construction Crew	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1			61	1220	Crew Days
Total No. Crews on Site per day	6	6	6	8	9	9	10	9	9	9	7	5	5	5	6	1	1	1	0		297	5940	Crew Days



APPENDIX C- CONSTRUCTION-RELATED AIR EMISSION WORKSHEETS



Rebuild By Design: Resist, Delay, Store, Discharge Project

Air Quality Technical Environmental Study – Key Inputs

Construction-Related Air Quality Assessment

2019 NONROAD							
Equipment	Model	Usage Factor	Peak HP	Emission Factors (grams/brake-horsepower-hour)[2]			
				CO	NO_X	$PM_{2.5}$	VOC
Excavator	Kamatsu PC750C-7	0.59	474	4.52276	4.46363	0.35171	0.62268
Crane	LinkBelt 218 HYLAB	0.43	266	1.18784	3.81077	0.13447	0.26961
Backhoe	CAT416C	0.21	84	4.23853	4.52542	0.56963	0.70758
Bore Rig[1]	ABI Piling Rig	0.43	345	4.45453	4.91768	0.38204	0.65432
Dump Trucks	DT-12CY	0.59	350	7.79423	5.67032	0.88256	1.41511
Concrete Pump Truck	Pump Truck	0.20	350	4.45786	4.63445	0.41105	0.67902
Concrete Mixer Truck	Concrete Mixer 10.5 CY	1.00	350	4.58069	5.39571	0.52435	0.82465

2019 VEHICLES TRAVELING WITHIN AND TO/FROM WORKSITE							
Equipment	MOVES2014a Source Type	Speed (mph)	Miles	Emission Factors (g/veh-mi)[2]			
				CO	NO_X	$PM_{2.5}$	VOC
On-Site Truck Deliveries	52	2.5 <= Speed < 7.5 (SpeedBin 2)	0.5	3.43713	9.31931	0.57455	1.28154
On-Road Truck Deliveries	52	27.5 <= Speed < 32.5 (SpeedBin 7)	150.0	0.99611	2.77844	0.13583	0.27559
Worker Vehicles	30	27.5 <= Speed < 32.5 (SpeedBin 7)	150.0	3.13764	0.22844	0.01291	0.04790

[1] *Emission Factor averaged over year.*

[2] *MOVES run performed for all months in the year. Value shown is representative of the Emission Factor for the selected pollutant.*

Rebuild By Design: Resist, Delay, Store, Discharge Project

Air Quality Technical Environmental Study – Key Inputs

Construction-Related Air Quality Assessment

2020 NONROAD							
Equipment	Model	Usage Factor	Peak HP	Emission Factors (grams/brake-horsepower-hour)[2]			
				CO	NO_X	$PM_{2.5}$	VOC
Excavator	Kamatsu PC750C-7	0.59	474	4.52286	4.46364	0.35185	0.62268
Crane	LinkBelt 218 HYLAB	0.43	266	1.01797	3.61079	0.10812	0.25656
Backhoe	CAT416C	0.21	84	3.93482	4.50379	0.51927	0.64671
Bore Rig[1]	ABI Piling Rig	0.43	345	4.45586	4.70900	0.36695	0.64545
Dump Trucks	DT-12CY	0.59	350	7.43405	5.46646	0.81491	1.31256
Concrete Pump Truck	Pump Truck	0.20	350	4.45304	4.59168	0.39392	0.66560
Concrete Mixer Truck	Concrete Mixer 10.5 CY	1.00	350	4.54837	5.22643	0.49818	0.79367

2020 VEHICLES TRAVELING WITHIN AND TO/FROM WORKSITE							
Equipment	MOVES2014a Source Type	Speed (mph)	Miles	Emission Factors (g/veh-mi)[2]			
				CO	NO_X	$PM_{2.5}$	VOC
On-Site Truck Deliveries	52	2.5 <= Speed < 7.5 (SpeedBin 2)	0.5	2.99009	8.17522	0.48081	1.07642
On-Road Truck Deliveries	52	27.5 <= Speed < 32.5 (SpeedBin 7)	150.0	1.73282	2.43506	0.11168	0.23168
Worker Vehicles	30	27.5 <= Speed < 32.5 (SpeedBin 7)	150.0	3.01255	0.20312	0.01241	0.04193

[1] *Emission Factor averaged over year.*

[2] *MOVES run performed for all months in the year. Value shown is representative of the Emission Factor for the selected pollutant.*

Rebuild By Design: Resist, Delay, Store, Discharge Project

Air Quality Technical Environmental Study – Key Inputs

Construction-Related Air Quality Assessment

2021 NONROAD							
Equipment	Model	Usage Factor	Peak HP	Emission Factors (grams/brake-horsepower-hour)[2]			
				CO	NO_X	$PM_{2.5}$	VOC
Excavator	Kamatsu PC750C-7	0.59	474	4.52295	4.46365	0.35186	0.62268
Crane	LinkBelt 218 HYLAB	0.43	266	0.85518	3.42259	0.09392	0.24458
Backhoe	CAT416C	0.21	84	3.64179	4.49095	0.47034	0.58900
Bore Rig[1]	ABI Piling Rig	0.43	345	4.45423	4.50797	0.35931	0.63872
Dump Trucks	DT-12CY	0.59	350	7.09758	5.28836	0.75436	1.22002
Concrete Pump Truck	Pump Truck	0.20	350	4.45228	4.56138	0.37909	0.65584
Concrete Mixer Truck	Concrete Mixer 10.5 CY	1.00	350	4.52086	5.07542	0.47464	0.76585

2021 VEHICLES TRAVELING WITHIN AND TO/FROM WORKSITE							
Equipment	MOVES2014a Source Type	Speed (mph)	Miles	Emission Factors (g/veh-mi)[2]			
				CO	NO_X	$PM_{2.5}$	VOC
On-Site Truck Deliveries	52	2.5 <= Speed < 7.5 (SpeedBin 2)	0.5	2.60630	7.18393	0.42045	0.90044
On-Road Truck Deliveries	52	27.5 <= Speed < 32.5 (SpeedBin 7)	150.0	1.51003	4.01186	0.09624	0.19410
Worker Vehicles	30	27.5 <= Speed < 32.5 (SpeedBin 7)	150.0	2.86556	0.18222	0.01200	0.03755

[1] *Emission Factor averaged over year.*

[2] *MOVES run performed for all months in the year. Value shown is representative of the Emission Factor for the selected pollutant.*

Rebuild By Design: Resist, Delay, Store, Discharge Project

Air Quality Technical Environmental Study – Key Inputs

Construction-Related Air Quality Assessment

2022 NONROAD							
Equipment	Model	Usage Factor	Peak HP	Emission Factors (grams/brake-horsepower-hour)[2]			
				CO	NO_X	$PM_{2.5}$	VOC
Excavator	Kamatsu PC750C-7	0.59	474	4.52304	4.46364	0.35188	0.62268
Crane	LinkBelt 218 HYLAB	0.43	266	0.70058	3.24804	0.08588	0.23355
Backhoe	CAT416C	0.21	84	3.36033	4.48102	0.42307	0.53447
Bore Rig[1]	ABI Piling Rig	0.43	345	4.45300	4.48850	0.35372	0.63343
Dump Trucks	DT-12CY	0.59	350	6.79569	5.15342	0.70579	1.14350
Concrete Pump Truck	Pump Truck	0.20	350	4.45245	4.53671	0.36633	0.64787
Concrete Mixer Truck	Concrete Mixer 10.5 CY	1.00	350	4.50531	4.96737	0.45773	0.74533

2022 VEHICLES TRAVELING WITHIN AND TO/FROM WORKSITE							
Equipment	MOVES2014a Source Type	Speed (mph)	Miles	Emission Factors (g/veh-mi)[2]			
				CO	NO_X	$PM_{2.5}$	VOC
On-Site Truck Deliveries	52	2.5 <= Speed < 7.5 (SpeedBin 2)	0.5	2.31421	6.34501	0.36774	0.76844
On-Road Truck Deliveries	52	27.5 <= Speed < 32.5 (SpeedBin 7)	150.0	1.34045	3.54185	0.08289	0.16580
Worker Vehicles	30	27.5 <= Speed < 32.5 (SpeedBin 7)	150.0	2.70713	0.16317	0.01166	0.03387

[1] *Emission Factor averaged over year.*

[2] *MOVES run performed for all months in the year. Value shown is representative of the Emission Factor for the selected pollutant.*

Rebuild By Design: Resist, Delay, Store, Discharge Project

Air Quality Technical Environmental Study – Key Inputs

Construction-Related Air Quality Assessment

2019-2022 Vehicle Fleet Age[1]		
SourceTypeID	AgeID	AgeFraction
31	0	0.06247132
31	1	0.08319917
31	2	0.08279160
31	3	0.08180565
31	4	0.08005042
31	5	0.07738674
31	6	0.07373784
31	7	0.06909993
31	8	0.06354860
31	9	0.05723773
31	10	0.05038930
31	11	0.04327397
31	12	0.03618420
31	13	0.03309787
31	14	0.02521575
31	15	0.01921073
31	16	0.01463578
31	17	0.01115033
31	18	0.00849493
31	19	0.00647190
31	20	0.00493064
31	21	0.00375643
31	22	0.00286185
31	23	0.00218031
31	24	0.00166108
31	25	0.00126550
31	26	0.00096413
31	27	0.00073453
31	28	0.00055960
31	29	0.00042634
31	30	0.00120584

2019-2022 Vehicle Fleet Age[1]		
SourceTypeID	AgeID	AgeFraction
52	0	0.05189965
52	1	0.05189965
52	2	0.05189957
52	3	0.05189867
52	4	0.05189405
52	5	0.05187796
52	6	0.05183406
52	7	0.05173258
52	8	0.05152456
52	9	0.05113567
52	10	0.05046074
52	11	0.04936100
52	12	0.04766761
52	13	0.04519662
52	14	0.04376973
52	15	0.03737277
52	16	0.03191073
52	17	0.02724697
52	18	0.02326482
52	19	0.01986466
52	20	0.01696144
52	21	0.01448252
52	22	0.01236590
52	23	0.01055862
52	24	0.00901547
52	25	0.00769786
52	26	0.00657282
52	27	0.00561220
52	28	0.00479197
52	29	0.00409163
52	30	0.01413752

[1] - Vehicle fleet age for vehicle source type 31 (passenger trucks) and 52 (single-unit short-haul trucks) provided by NJDEP

2019 AIR EMISSION WORKSHEETS

2019 HOBOKEN CO EMISSIONS WORKSHEET; Alternative 1, Option 1

2019

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	424985	384510	424984	445221	445222	404748	445221	445221	404747	445222	384510	424985	5079576
Crane	0	0	0	0	0	0	0	0	21738	0	0	0	21738
Backhoe	75366	68188	75366	78954	78955	71777	78954	78954	71777	39477	34094	37683	789545
Bore Rig	0	0	444077	465224	465224	422931	465224	0	0	0	0	0	2262679
Dump Trucks	811190	733935	811192	1699637	1699640	1545126	1699638	1699638	1545124	1699639	489289	540794	14974841
Concrete Pump Truck	0	0	52424	54921	54921	49928	54921	54921	49928	54921	47432	52424	526739
Concrete Mixer Truck	0	0	269345	282170	282171	256518	282171	282171	256518	282171	60923	67336	2321492
On-Site Truck Deliveries	72	65	397	416	416	378	416	416	344	378	131	144	3573
On-Road Truck Deliveries	6275	5678	34515	36159	36159	32872	36159	36159	29883	32872	11356	12551	310636
Worker Vehicles	310653	281067	416050	466995	483342	558896	667847	520164	398126	249064	188213	217457	4757874

TOTAL CO EMISSIONS FOR 2019	**31048694**	**g/year**
	34.216	**tons/year**

2019 HOBOKEN CO EMISSIONS WORKSHEET; Alternative 1, Option 2

2019

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	424985	384510	424984	445221	445222	404748	445221	445221	404747	445222	384510	424985	5079576
Crane	0	0	0	0	0	0	0	0	21738	0	0	0	21738
Backhoe	75366	68188	75366	78954	78955	71777	78954	78954	71777	39477	34094	37683	789545
Bore Rig	0	0	444077	465224	465224	422931	465224	0	0	0	0	0	2262679
Dump Trucks	811190	733935	811192	1699637	1699640	1545126	1699638	1699638	1545124	1699639	489289	540794	14974841
Concrete Pump Truck	0	0	52424	54921	54921	49928	54921	54921	49928	54921	47432	52424	526739
Concrete Mixer Truck	0	0	269345	282170	282171	256518	282171	282171	256518	282171	60923	67336	2321492
On-Site Truck Deliveries	72	65	397	416	416	378	416	416	344	378	131	144	3573
On-Road Truck Deliveries	6275	5678	34515	36159	36159	32872	36159	36159	29883	32872	11356	12551	310636
Worker Vehicles	310653	281067	416050	466995	483342	558896	667847	520164	398126	249064	188213	217457	4757874

TOTAL CO EMISSIONS FOR 2019	**31048694**	**g/year**
	34.216	**tons/year**

2019 AIR EMISSION WORKSHEETS

2019 HOBOKEN CO EMISSIONS WORKSHEET; Alternative 2, Option 1

2019

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	424985	384510	424984	445221	445222	404748	445221	445221	404747	445222	384510	424985	5079576
Crane	0	0	0	0	0	0	0	0	21738	0	0	0	21738
Backhoe	37683	34094	37683	78954	78955	71777	78954	78954	71777	78955	22729	25122	695637
Bore Rig	0	0	222039	232612	232612	211465	232612	0	0	0	0	222039	1353378
Dump Trucks	811190	733935	811192	1699637	1699640	1545126	1699638	1699638	1545124	1699639	489289	540794	14974841
Concrete Pump Truck	0	0	52424	54921	54921	49928	54921	0	0	0	0	0	267114
Concrete Mixer Truck	0	0	269345	282170	282171	256518	282171	282171	256518	282171	60923	67336	2321492
On-Site Truck Deliveries	72	65	361	378	378	344	378	340	309	340	98	108	3172
On-Road Truck Deliveries	6275	5678	31377	32872	32872	29883	32872	29584	26895	29584	8517	9413	275822
Worker Vehicles	217457	196747	267461	280197	322228	372597	445231	346776	265417	186798	134438	217457	3252804

TOTAL CO EMISSIONS FOR 2019	**28245576**	**g/year**
	31.127	**tons/year**

2019 HOBOKEN CO EMISSIONS WORKSHEET; Alternative 2, Option 2

2019

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	424985	384510	424984	445221	445222	404748	445221	445221	404747	445222	384510	424985	5079576
Crane	0	0	0	0	0	0	0	0	21738	0	0	0	21738
Backhoe	12561	34094	37683	52636	78955	71777	78954	78954	71777	78955	22729	25122	644197
Bore Rig	0	0	222039	232612	232612	211465	232612	232612	0	0	0	222039	1585990
Dump Trucks	270397	733935	811192	1133091	1699640	1545126	1699638	1699638	1545124	1699639	489289	540794	13867502
Concrete Pump Truck	0	0	52424	54921	54921	49928	54921	0	0	0	0	0	267114
Concrete Mixer Truck	0	0	134672	141085	141085	128259	141085	105814	96194	105814	60923	67336	1122268
On-Site Truck Deliveries	72	65	253	265	265	241	265	189	137	151	98	108	2109
On-Road Truck Deliveries	6275	5678	21964	23010	23010	20918	23010	16436	11953	13149	8517	9413	183334
Worker Vehicles	217457	196747	267461	280197	322228	372597	445231	346776	265417	186798	134438	217457	3252804

TOTAL CO EMISSIONS FOR 2019	**26026632**	**g/year**
	28.681	**tons/year**

2019 AIR EMISSION WORKSHEETS

2019 HOBOKEN CO EMISSIONS WORKSHEET; Alternative 3, Option 1

2019

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	212492	192255	212492	222611	222611	202374	222611	222611	202374	222611	192255	212492	2539788
Crane	0	0	0	0	0	0	0	0	21738	0	0	0	21738
Backhoe	12561	45459	50244	65795	52636	47851	52636	52636	47851	52636	22729	25122	528158
Bore Rig	0	0	222039	232612	232612	0	0	0	0	0	0	0	687262
Dump Trucks	270397	978580	1081589	1416364	1133093	1030084	1133092	1133092	1030083	1133092	489289	540794	11369549
Concrete Pump Truck	0	0	52424	54921	54921	49928	54921	0	0	0	0	0	267114
Concrete Mixer Truck	0	0	101004	105814	105814	96194	105814	105814	64130	35271	30462	33668	783985
On-Site Truck Deliveries	0	33	180	189	151	172	189	113	103	76	65	72	1344
On-Road Truck Deliveries	0	2839	15689	16436	13149	14942	16436	9861	8965	6574	5678	6275	116843
Worker Vehicles	186392	168640	237743	249064	290005	260818	311662	303429	232240	186798	134438	155327	2716555

TOTAL CO EMISSIONS FOR 2019	**19032337**	**g/year**
	20.974	**tons/year**

2019 HOBOKEN CO EMISSIONS WORKSHEET; Alternative 3, Option 2

2019

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	212492	192255	212492	222611	222611	404748	445221	445221	404747	445222	384510	424985	4017115
Crane	0	0	0	0	0	0	0	0	21738	0	0	0	21738
Backhoe	12561	45459	50244	65795	52636	47851	52636	52636	47851	52636	22729	25122	528158
Bore Rig	0	0	222039	232612	232612	211465	0	0	0	0	0	0	898728
Dump Trucks	270397	978580	1081589	1416364	1133093	1030084	1133092	1133092	1030083	1133092	489289	540794	11369549
Concrete Pump Truck	0	0	52424	54921	54921	49928	54921	0	0	0	0	0	267114
Concrete Mixer Truck	0	0	101004	105814	105814	96194	105814	105814	64130	35271	30462	33668	783985
On-Site Truck Deliveries	0	33	180	189	151	172	189	113	103	76	65	72	1344
On-Road Truck Deliveries	0	2839	15689	16436	13149	14942	16436	9861	8965	6574	5678	6275	116843
Worker Vehicles	186392	168640	237743	249064	290005	298078	311662	303429	232240	186798	134438	155327	2753815

TOTAL CO EMISSIONS FOR 2019	**20758389**	**g/year**
	22.876	**tons/year**

2019 AIR EMISSION WORKSHEETS

2019 HOBOKEN NOx EMISSIONS WORKSHEET; Alternative 1, Option 1

2019

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	419428	379481	419428	439401	439401	399455	439401	439401	399455	439401	379482	419428	5013162
Crane	0	0	0	0	0	0	0	0	69740	0	0	0	69740
Backhoe	80467	72803	80467	84299	84299	76635	84299	84299	76635	42149	36402	40233	842987
Bore Rig	0	0	490249	513594	513594	466904	513594	0	0	0	0	0	2497937
Dump Trucks	590144	533940	590143	1236491	1236491	1124084	1236491	1236491	1124083	1236492	355960	393429	10894238
Concrete Pump Truck	0	0	54501	57096	57096	51906	57096	57096	51906	57096	49310	54501	547606
Concrete Mixer Truck	0	0	317267	332374	332375	302157	332374	332374	302157	332374	71762	79317	2734532
On-Site Truck Deliveries	196	177	1076	1108	1058	907	963	970	849	985	349	391	9030
On-Road Truck Deliveries	17504	15837	96273	99089	94634	81149	86174	86749	75928	88097	31238	35008	807679
Worker Vehicles	30828	27892	43318	47475	45102	41556	45507	36103	32511	24565	19233	21580	415670

TOTAL NOx EMISSIONS FOR 2019	**23832582**	**g/year**
	26.264	**tons/year**

2019 HOBOKEN NOx EMISSIONS WORKSHEET; Alternative 1, Option 2

2019

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	419428	379481	419428	439401	439401	399455	439401	439401	399455	439401	379482	419428	5013162
Crane	0	0	0	0	0	0	0	0	69740	0	0	0	69740
Backhoe	80467	72803	80467	84299	84299	76635	84299	84299	76635	42149	36402	40233	842987
Bore Rig	0	0	490249	513594	513594	466904	513594	0	0	0	0	0	2497937
Dump Trucks	590144	533940	590143	1236491	1236491	1124084	1236491	1236491	1124083	1236492	355960	393429	10894238
Concrete Pump Truck	0	0	54501	57096	57096	51906	57096	57096	51906	57096	49310	54501	547606
Concrete Mixer Truck	0	0	317267	332374	332375	302157	332374	332374	302157	332374	71762	79317	2734532
On-Site Truck Deliveries	196	177	1076	1108	1058	907	963	970	849	985	349	391	9030
On-Road Truck Deliveries	17504	15837	96273	99089	94634	81149	86174	86749	75928	88097	31238	35008	807679
Worker Vehicles	30828	27892	43318	47475	45102	41556	45507	36103	32511	24565	19233	21580	415670

TOTAL NOx EMISSIONS FOR 2019	**23832582**	**g/year**
	26.264	**tons/year**

2019 AIR EMISSION WORKSHEETS

2019 HOBOKEN NOx EMISSIONS WORKSHEET; Alternative 2, Option 1

2019

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	419428	379481	419428	439401	439401	399455	439401	439401	399455	439401	379482	419428	5013162
Crane	0	0	0	0	0	0	0	0	69740	0	0	0	69740
Backhoe	40233	36402	40234	84299	84299	76635	84299	84299	76635	84299	24268	26822	742723
Bore Rig	0	0	245125	256797	256797	233452	256797	0	0	0	0	245125	1494093
Dump Trucks	590144	533940	590143	1236491	1236491	1124084	1236491	1236491	1124083	1236492	355960	393429	10894238
Concrete Pump Truck	0	0	54501	57096	57096	51906	57096	0	0	0	0	0	277696
Concrete Mixer Truck	0	0	317267	332374	332375	302157	332374	332374	302157	332374	71762	79317	2734532
On-Site Truck Deliveries	196	177	979	1007	962	825	876	794	764	886	262	294	8021
On-Road Truck Deliveries	17504	15837	87521	90081	86031	73771	78340	70976	68335	79287	23428	26256	717368
Worker Vehicles	21580	19524	27847	28485	30068	27704	30338	24069	21674	18424	13738	21580	285030

TOTAL NOx EMISSIONS FOR 2019	**22236603**	**g/year**
	24.505	**tons/year**

2019 HOBOKEN NOx EMISSIONS WORKSHEET; Alternative 2, Option 2

2019

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	419428	379481	419428	439401	439401	399455	439401	439401	399455	439401	379482	419428	5013162
Crane	0	0	0	0	0	0	0	0	69740	0	0	0	69740
Backhoe	13411	36402	40234	56199	84299	76635	84299	84299	76635	84299	24268	26822	687801
Bore Rig	0	0	245125	256797	256797	233452	256797	256797	0	0	0	245125	1750890
Dump Trucks	196715	533940	590143	824327	1236491	1124084	1236491	1236491	1124083	1236492	355960	393429	10088645
Concrete Pump Truck	0	0	54501	57096	57096	51906	57096	0	0	0	0	0	277696
Concrete Mixer Truck	0	0	158633	166187	166187	151079	166187	124640	113309	124640	71762	79317	1321942
On-Site Truck Deliveries	196	177	685	705	673	577	613	441	340	394	262	294	5356
On-Road Truck Deliveries	17504	15837	61265	63056	60222	51640	54838	39431	30371	35239	23428	26256	479088
Worker Vehicles	21580	19524	27847	28485	30068	27704	30338	24069	21674	18424	13738	21580	285030

TOTAL NOx EMISSIONS FOR 2019	**19979352**	**g/year**
	22.017	**tons/year**

2019 AIR EMISSION WORKSHEETS

2019 HOBOKEN NOx EMISSIONS WORKSHEET; Alternative 3, Option 1

2019

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	209714	189741	209714	219700	219700	199727	219701	219701	199728	219700	189741	209714	2506581
Crane	0	0	0	0	0	0	0	0	69740	0	0	0	69740
Backhoe	13411	48536	53645	70249	56199	51090	56199	56199	51090	56199	24268	26822	563907
Bore Rig	0	0	245125	256797	256797	0	0	0	0	0	0	0	758719
Dump Trucks	196715	711920	786858	1030409	824327	749389	824327	824327	749389	824328	355960	393429	8271378
Concrete Pump Truck	0	0	54501	57096	57096	51906	57096	0	0	0	0	0	277696
Concrete Mixer Truck	0	0	118975	124640	124641	113309	124640	124640	75539	41547	35881	39658	923471
On-Site Truck Deliveries	0	89	489	504	385	412	438	265	255	197	175	196	3403
On-Road Truck Deliveries	0	7919	43760	45040	34412	36886	39170	23659	22778	17619	15619	17504	304367
Worker Vehicles	18497	16735	24753	25320	27061	19393	21236	21060	18965	18424	13738	15414	240596

TOTAL NOx EMISSIONS FOR 2019	**13919859**	**g/year**
	15.340	**tons/year**

2019 HOBOKEN NOx EMISSIONS WORKSHEET; Alternative 3, Option 2

2019

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	209714	189741	209714	219700	219700	399455	439401	439401	399455	439401	379482	419428	3964593
Crane	0	0	0	0	0	0	0	0	69740	0	0	0	69740
Backhoe	13411	48536	53645	70249	56199	51090	56199	56199	51090	56199	24268	26822	563907
Bore Rig	0	0	245125	256797	256797	233452	0	0	0	0	0	0	992171
Dump Trucks	196715	711920	786858	1030409	824327	749389	824327	824327	749389	824328	355960	393429	8271378
Concrete Pump Truck	0	0	54501	57096	57096	51906	57096	0	0	0	0	0	277696
Concrete Mixer Truck	0	0	118975	124640	124641	113309	124640	124640	75539	41547	35881	39658	923471
On-Site Truck Deliveries	0	89	489	504	385	412	438	265	255	197	175	196	3403
On-Road Truck Deliveries	0	7919	43760	45040	34412	36886	39170	23659	22778	17619	15619	17504	304367
Worker Vehicles	18497	16735	24753	25320	27061	22163	21236	21060	18965	18424	13738	15414	243367

TOTAL NOx EMISSIONS FOR 2019	**15614093**	**g/year**
	17.207	**tons/year**

2019 AIR EMISSION WORKSHEETS

2019 HOBOKEN PM2.5 EMISSIONS WORKSHEET; Alternative 1, Option 1

2019

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	33049	29901	33049	34622	34622	31475	34622	34622	31475	34623	29901	33049	395011
Crane	0	0	0	0	0	0	0	0	2461	0	0	0	2461
Backhoe	10129	9164	10129	10611	10611	9646	10611	10611	9646	5305	4582	5064	106109
Bore Rig	0	0	38086	39900	39900	36273	39900	0	0	0	0	0	194059
Dump Trucks	91853	83105	91853	192453	192453	174957	192453	192453	174958	192453	55403	61235	1695630
Concrete Pump Truck	0	0	4834	5064	5064	4604	5064	5064	4604	5064	4374	4834	48570
Concrete Mixer Truck	0	0	30832	32300	32300	29363	32300	32300	29363	32300	6974	7708	265740
On-Site Truck Deliveries	12	11	66	70	70	63	70	70	57	63	22	24	597
On-Road Truck Deliveries	856	774	712	4931	4931	4482	4931	4931	4075	4482	1548	1711	38363
Worker Vehicles	1748	1574	2373	2580	2519	2257	2471	1981	1824	1369	1055	1204	22955

TOTAL PM2.5 EMISSIONS FOR 2019	**2769494**	**g/year**
	3.052	**tons/year**

2019 HOBOKEN PM2.5 EMISSIONS WORKSHEET; Alternative 1, Option 2

2019

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	33049	29901	33049	34622	34622	31475	34622	34622	31475	34623	29901	33049	395011
Crane	0	0	0	0	0	0	0	0	2461	0	0	0	2461
Backhoe	10129	9164	10129	10611	10611	9646	10611	10611	9646	5305	4582	5064	106109
Bore Rig	0	0	38086	39900	39900	36273	39900	0	0	0	0	0	194059
Dump Trucks	91853	83105	91853	192453	192453	174957	192453	192453	174958	192453	55403	61235	1695630
Concrete Pump Truck	0	0	4834	5064	5064	4604	5064	5064	4604	5064	4374	4834	48570
Concrete Mixer Truck	0	0	30832	32300	32300	29363	32300	32300	29363	32300	6974	7708	265740
On-Site Truck Deliveries	12	11	66	70	70	63	70	70	57	63	22	24	597
On-Road Truck Deliveries	856	774	712	4931	4931	4482	4931	4931	4075	4482	1548	1711	38363
Worker Vehicles	1748	1574	2373	2580	2519	2257	2471	1981	1824	1369	1055	1204	22955

TOTAL PM2.5 EMISSIONS FOR 2019	**2769494**	**g/year**
	3.052	**tons/year**

2019 AIR EMISSION WORKSHEETS

2019 HOBOKEN PM2.5 EMISSIONS WORKSHEET; Alternative 2, Option 1

2019

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	33049	29901	33049	34622	34622	31475	34622	34622	31475	34623	29901	33049	395011
Crane	0	0	0	0	0	0	0	0	2461	0	0	0	2461
Backhoe	5064	4582	5064	10611	10611	9646	10611	10611	9646	10611	3055	3376	93488
Bore Rig	0	0	19043	19950	19950	18136	19950	0	0	0	0	19043	116072
Dump Trucks	91853	83105	91853	192453	192453	174957	192453	192453	174958	192453	55403	61235	1695630
Concrete Pump Truck	0	0	4834	5064	5064	4604	5064	0	0	0	0	0	24630
Concrete Mixer Truck	0	0	30832	32300	32300	29363	32300	32300	29363	32300	6974	7708	265740
On-Site Truck Deliveries	12	11	60	63	63	57	63	57	52	57	16	18	530
On-Road Truck Deliveries	856	774	647	4482	4482	4075	4482	4034	3667	4034	1161	1284	33979
Worker Vehicles	1224	1101	1526	1548	1679	1505	1647	1320	1216	1027	754	1204	15751

TOTAL PM2.5 EMISSIONS FOR 2019	**2643293**	**g/year**
	2.913	**tons/year**

2019 HOBOKEN PM2.5 EMISSIONS WORKSHEET; Alternative 2, Option 2

2019

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	33049	29901	33049	34622	34622	31475	34622	34622	31475	34623	29901	33049	395011
Crane	0	0	0	0	0	0	0	0	2461	0	0	0	2461
Backhoe	1688	4582	5064	7074	10611	9646	10611	10611	9646	10611	3055	3376	86575
Bore Rig	0	0	19043	19950	19950	18136	19950	19950	0	0	0	19043	136022
Dump Trucks	30618	83105	91853	128302	192453	174957	192453	192453	174958	192453	55403	61235	1570244
Concrete Pump Truck	0	0	4834	5064	5064	4604	5064	0	0	0	0	0	24630
Concrete Mixer Truck	0	0	15416	16150	16150	14682	16150	12112	11011	12112	6974	7708	128465
On-Site Truck Deliveries	12	11	42	44	44	40	44	32	23	25	16	18	352
On-Road Truck Deliveries	856	774	453	3138	3138	2852	3138	2241	1630	1793	1161	1284	22457
Worker Vehicles	1224	1101	1526	1548	1679	1505	1647	1320	1216	1027	754	1204	15751

TOTAL PM2.5 EMISSIONS FOR 2019	**2381969**	**g/year**
	2.625	**tons/year**

2019 AIR EMISSION WORKSHEETS

2019 HOBOKEN PM2.5 EMISSIONS WORKSHEET; Alternative 3, Option 1

2019

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	16524	14951	16524	17311	17311	15737	17311	17311	15737	17311	14951	16524	197505
Crane	0	0	0	0	0	0	0	0	2461	0	0	0	2461
Backhoe	1688	6109	6752	8842	7074	6431	7074	7074	6431	7074	3055	3376	70980
Bore Rig	0	0	19043	19950	19950	0	0	0	0	0	0	0	58943
Dump Trucks	30618	110807	122470	160378	128302	116638	128302	128302	116638	128302	55403	61235	1287396
Concrete Pump Truck	0	0	4834	5064	5064	4604	5064	0	0	0	0	0	24630
Concrete Mixer Truck	0	0	11562	12112	12112	11011	12112	12112	7341	4037	3487	3854	89742
On-Site Truck Deliveries	0	5	30	32	25	29	32	19	17	13	11	12	225
On-Road Truck Deliveries	0	387	324	2241	1793	2037	2241	1345	1222	896	774	856	14117
Worker Vehicles	1049	944	1356	1376	1511	1053	1153	1155	1064	1027	754	860	13303

TOTAL PM2.5 EMISSIONS FOR 2019	**1759302**	**g/year**
	1.939	**tons/year**

2019 HOBOKEN PM2.5 EMISSIONS WORKSHEET; Alternative 3, Option 2

2019

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	16524	14951	16524	17311	17311	31475	34622	34622	31475	34623	29901	33049	312389
Crane	0	0	0	0	0	0	0	0	2461	0	0	0	2461
Backhoe	1688	6109	6752	8842	7074	6431	7074	7074	6431	7074	3055	3376	70980
Bore Rig	0	0	19043	19950	19950	18136	0	0	0	0	0	0	77079
Dump Trucks	30618	110807	122470	160378	128302	116638	128302	128302	116638	128302	55403	61235	1287396
Concrete Pump Truck	0	0	4834	5064	5064	4604	5064	0	0	0	0	0	24630
Concrete Mixer Truck	0	0	11562	12112	12112	11011	12112	12112	7341	4037	3487	3854	89742
On-Site Truck Deliveries	0	5	30	32	25	29	32	19	17	13	11	12	225
On-Road Truck Deliveries	0	387	324	2241	1793	2037	2241	1345	1222	896	774	856	14117
Worker Vehicles	1049	944	1356	1376	1511	1204	1153	1155	1064	1027	754	860	13453

TOTAL PM2.5 EMISSIONS FOR 2019	**1892473**	**g/year**
	2.086	**tons/year**

2019 AIR EMISSION WORKSHEETS

2019 HOBOKEN VOC EMISSIONS WORKSHEET; Alternative 1, Option 1

2019

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	58510	52938	58510	61296	61297	55724	61296	61296	55724	61296	52938	58510	699337
Crane	0	0	0	0	0	0	0	0	4934	0	0	0	4934
Backhoe	12582	11383	12582	13181	13181	11982	13181	13181	11982	6590	5692	6291	131806
Bore Rig	0	0	65230	68336	68336	62124	68336	0	0	0	0	0	332362
Dump Trucks	147279	133252	147279	308584	308584	280530	308583	308583	280529	308584	88834	98186	2718806
Concrete Pump Truck	0	0	7985	8365	8365	7605	8365	8365	7605	8365	7225	7985	80232
Concrete Mixer Truck	0	0	48489	50798	50798	46180	50798	50798	46180	50798	10968	12122	417929
On-Site Truck Deliveries	27	24	147	154	155	141	155	155	128	140	48	54	1329
On-Road Truck Deliveries	1727	1563	9500	9952	9964	9084	10004	10000	8246	9047	3125	3454	85668
Worker Vehicles	5539	5029	7979	9069	9320	9032	10195	8086	6994	4855	3624	3901	83624

TOTAL VOC EMISSIONS FOR 2019	**4556029**	**g/year**
	5.021	**tons/year**

2019 HOBOKEN VOC EMISSIONS WORKSHEET; Alternative 1, Option 2

2019

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	58510	52938	58510	61296	61297	55724	61296	61296	55724	61296	52938	58510	699337
Crane	0	0	0	0	0	0	0	0	4934	0	0	0	4934
Backhoe	12582	11383	12582	13181	13181	11982	13181	13181	11982	6590	5692	6291	131806
Bore Rig	0	0	65230	68336	68336	62124	68336	0	0	0	0	0	332362
Dump Trucks	147279	133252	147279	308584	308584	280530	308583	308583	280529	308584	88834	98186	2718806
Concrete Pump Truck	0	0	7985	8365	8365	7605	8365	8365	7605	8365	7225	7985	80232
Concrete Mixer Truck	0	0	48489	50798	50798	46180	50798	50798	46180	50798	10968	12122	417929
On-Site Truck Deliveries	27	24	147	154	155	141	155	155	128	140	48	54	1329
On-Road Truck Deliveries	1727	1563	9500	9952	9964	9084	10004	10000	8246	9047	3125	3454	85668
Worker Vehicles	5539	5029	7979	9069	9320	9032	10195	8086	6994	4855	3624	3901	83624

TOTAL VOC EMISSIONS FOR 2019	**4556029**	**g/year**
	5.021	**tons/year**

2019 AIR EMISSION WORKSHEETS

2019 HOBOKEN VOC EMISSIONS WORKSHEET; Alternative 2, Option 1

2019

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	58510	52938	58510	61296	61297	55724	61296	61296	55724	61296	52938	58510	699337
Crane	0	0	0	0	0	0	0	0	4934	0	0	0	4934
Backhoe	6291	5692	6291	13181	13181	11982	13181	13181	11982	13181	3794	4194	116129
Bore Rig	0	0	32615	34168	34168	31062	34168	0	0	0	0	32615	198796
Dump Trucks	147279	133252	147279	308584	308584	280530	308583	308583	280529	308584	88834	98186	2718806
Concrete Pump Truck	0	0	7985	8365	8365	7605	8365	0	0	0	0	0	40687
Concrete Mixer Truck	0	0	48489	50798	50798	46180	50798	50798	46180	50798	10968	12122	417929
On-Site Truck Deliveries	27	24	134	140	141	128	141	127	115	126	36	40	1180
On-Road Truck Deliveries	1727	1563	8636	9047	9059	8258	9094	8182	7422	8143	2344	2591	76066
Worker Vehicles	3878	3520	5129	5441	6213	6022	6797	5390	4663	3642	2588	3901	57185

TOTAL VOC EMISSIONS FOR 2019	**4331049**	**g/year**
	4.773	**tons/year**

2019 HOBOKEN VOC EMISSIONS WORKSHEET; Alternative 2, Option 2

2019

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	58510	52938	58510	61296	61297	55724	61296	61296	55724	61296	52938	58510	699337
Crane	0	0	0	0	0	0	0	0	4934	0	0	0	4934
Backhoe	2097	5692	6291	8787	13181	11982	13181	13181	11982	13181	3794	4194	107542
Bore Rig	0	0	32615	34168	34168	31062	34168	34168	0	0	0	32615	232964
Dump Trucks	49093	133252	147279	205722	308584	280530	308583	308583	280529	308584	88834	98186	2517759
Concrete Pump Truck	0	0	7985	8365	8365	7605	8365	0	0	0	0	0	40687
Concrete Mixer Truck	0	0	24244	25399	25399	23090	25399	19049	17317	19049	10968	12122	202037
On-Site Truck Deliveries	27	24	94	98	98	90	99	70	51	56	36	40	784
On-Road Truck Deliveries	1727	1563	6045	6333	6341	5781	6366	4546	3299	3619	2344	2591	50554
Worker Vehicles	3878	3520	5129	5441	6213	6022	6797	5390	4663	3642	2588	3901	57185

TOTAL VOC EMISSIONS FOR 2019	**3913784**	**g/year**
	4.313	**tons/year**

2019 AIR EMISSION WORKSHEETS

2019 HOBOKEN VOC EMISSIONS WORKSHEET; Alternative 3, Option 1

2019

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	29255	26469	29255	30648	30648	27862	30648	30648	27862	30648	26469	29255	349669
Crane	0	0	0	0	0	0	0	0	4934	0	0	0	4934
Backhoe	2097	7589	8388	10984	8787	7988	8787	8787	7988	8787	3794	4194	88170
Bore Rig	0	0	32615	34168	34168	0	0	0	0	0	0	0	100951
Dump Trucks	49093	177670	196372	257153	205723	187020	205722	205722	187020	205722	88834	98186	2064236
Concrete Pump Truck	0	0	7985	8365	8365	7605	8365	0	0	0	0	0	40687
Concrete Mixer Truck	0	0	18183	19049	19049	17317	19049	19049	11545	6350	5484	6061	141138
On-Site Truck Deliveries	0	12	67	70	56	64	70	42	38	28	24	27	500
On-Road Truck Deliveries	0	781	4318	4524	3623	4129	4547	2727	2474	1809	1563	1727	32224
Worker Vehicles	3324	3017	4559	4837	5592	4215	4758	4717	4080	3642	2588	2787	48115

TOTAL VOC EMISSIONS FOR 2019	**2870623**	**g/year**
	3.163	**tons/year**

2019 HOBOKEN VOC EMISSIONS WORKSHEET; Alternative 3, Option 2

2019

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	29255	26469	29255	30648	30648	55724	61296	61296	55724	61296	52938	58510	553061
Crane	0	0	0	0	0	0	0	0	4934	0	0	0	4934
Backhoe	2097	7589	8388	10984	8787	7988	8787	8787	7988	8787	3794	4194	88170
Bore Rig	0	0	32615	34168	34168	31062	0	0	0	0	0	0	132013
Dump Trucks	49093	177670	196372	257153	205723	187020	205722	205722	187020	205722	88834	98186	2064236
Concrete Pump Truck	0	0	7985	8365	8365	7605	8365	0	0	0	0	0	40687
Concrete Mixer Truck	0	0	18183	19049	19049	17317	19049	19049	11545	6350	5484	6061	141138
On-Site Truck Deliveries	0	12	67	70	56	64	70	42	38	28	24	27	500
On-Road Truck Deliveries	0	781	4318	4524	3623	4129	4547	2727	2474	1809	1563	1727	32224
Worker Vehicles	3324	3017	4559	4837	5592	4817	4758	4717	4080	3642	2588	2787	48717

TOTAL VOC EMISSIONS FOR 2019	**3105680**	**g/year**
	3.422	**tons/year**

2020 AIR EMISSION WORKSHEETS

2020 HOBOKEN CO EMISSIONS WORKSHEET; Alternative 1, Option 1

2020

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	424993	384517	445231	445231	404755	445231	445231	424993	424993	424994	384518	445231	5099917
Crane	0	0	0	0	0	0	20493	0	0	19561	0	0	40054
Backhoe	34983	31651	36648	73297	66633	73297	73297	69965	69965	69965	63302	36649	699652
Bore Rig	0	0	0	465363	423057	465363	465363	444210	0	0	0	0	2263354
Dump Trucks	257902	233340	270183	1080731	982483	1621097	1621098	1547411	1547411	1547410	466679	540366	11716110
Concrete Pump Truck	52368	47380	54861	54861	49874	54861	54861	52368	52368	52368	47380	54861	628413
Concrete Mixer Truck	66861	60493	70044	280179	254707	280179	280179	267443	267443	66861	60493	70044	2024927
On-Site Truck Deliveries	126	114	132	362	329	395	395	377	377	126	114	132	2975
On-Road Truck Deliveries	10917	9877	11437	31451	57183	34310	68620	32750	32750	10917	9877	11437	321524
Worker Vehicles	178237	161262	238990	477979	477742	668851	641221	595871	367745	313674	258000	186725	4566298

TOTAL CO EMISSIONS FOR 2020	**27363224**	**g/year**
	30.154	**tons/year**

2020 HOBOKEN CO EMISSIONS WORKSHEET; Alternative 1, Option 2

2020

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	424993	384517	445231	445231	404755	445231	445231	424993	424993	424994	384518	445231	5099917
Crane	0	0	0	20493	0	0	20493	0	0	19561	0	0	60546
Backhoe	34983	31651	36648	73297	66633	73297	73297	69965	69965	69965	63302	36649	699652
Bore Rig	0	0	0	465363	423057	465363	465363	444210	0	0	0	0	2263354
Dump Trucks	257902	233340	270183	1080731	982483	1621097	1621098	1547411	1547411	1547410	466679	540366	11716110
Concrete Pump Truck	52368	47380	54861	54861	49874	54861	54861	52368	52368	52368	47380	54861	628413
Concrete Mixer Truck	66861	60493	70044	280179	254707	280179	280179	267443	267443	66861	60493	70044	2024927
On-Site Truck Deliveries	126	114	132	362	329	395	395	377	377	126	114	132	2975
On-Road Truck Deliveries	10917	9877	11437	31451	57183	34310	68620	32750	32750	10917	9877	11437	321524
Worker Vehicles	178237	161262	238990	477979	477742	668851	641221	595871	367745	313674	258000	186725	4566298

TOTAL CO EMISSIONS FOR 2020	**27383716**	**g/year**
	30.177	**tons/year**

2020 AIR EMISSION WORKSHEETS

2020 HOBOKEN CO EMISSIONS WORKSHEET; Alternative 2, Option 1

2020

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	424993	384517	445231	445231	404755	445231	445231	424993	424993	424994	384518	445231	5099917
Crane	0	0	0	0	0	0	20493	0	0	19561	0	0	40054
Backhoe	11661	10550	12216	48864	44422	73297	73297	69965	69965	69965	21101	24432	529737
Bore Rig	222105	200952	232681	232681	0	0	0	0	0	0	0	0	888419
Dump Trucks	257902	233340	270183	1080731	982483	1621097	1621098	1547411	1547411	1547410	466679	540366	11716110
Concrete Pump Truck	0	0	0	54861	49874	54861	54861	52368	52368	52368	47380	54861	473803
Concrete Mixer Truck	66861	60493	70044	280179	254707	280179	280179	267443	267443	66861	60493	70044	2024927
On-Site Truck Deliveries	94	85	99	362	329	362	362	345	345	126	114	132	2754
On-Road Truck Deliveries	8188	7408	8577	31451	57183	31451	62901	30021	30021	10917	9877	11437	299431
Worker Vehicles	237650	188139	209116	328611	252922	354098	384732	357522	300882	256642	206400	217846	3294561

TOTAL CO EMISSIONS FOR 2020	**24369713**	**g/year**
	26.855	**tons/year**

2020 HOBOKEN CO EMISSIONS WORKSHEET; Alternative 2, Option 2

2020

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	424993	384517	445231	445231	404755	445231	445231	424993	424993	424994	384518	445231	5099917
Crane	0	0	0	0	0	0	20493	0	0	19561	0	0	40054
Backhoe	23322	21101	24432	36648	33317	73297	73297	69965	69965	69965	10550	12216	518076
Bore Rig	222105	200952	232681	232681	211528	0	0	0	0	0	0	0	1099948
Dump Trucks	515804	466679	540366	810548	736862	1621097	1621098	1547411	1547411	1547410	233340	270183	11458208
Concrete Pump Truck	0	0	0	54861	49874	54861	54861	52368	52368	52368	47380	54861	473803
Concrete Mixer Truck	66861	60493	70044	210134	191030	210134	210134	200583	200582	200583	181479	210133	2012191
On-Site Truck Deliveries	94	85	99	296	269	296	296	283	283	251	227	263	2742
On-Road Truck Deliveries	8188	7408	8577	25732	46786	25732	51465	24563	24563	21833	19754	22873	287474
Worker Vehicles	237650	188139	209116	328611	252922	354098	384732	357522	300882	256642	206400	217846	3294561

TOTAL CO EMISSIONS FOR 2020	**24286975**	**g/year**
	26.764	**tons/year**

2020 AIR EMISSION WORKSHEETS

2020 HOBOKEN CO EMISSIONS WORKSHEET; Alternative 3, Option 1

2020

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	212497	192259	222615	222615	202378	222615	222615	212497	212497	212497	192259	222615	2549959
Crane	0	0	0	0	0	0	20493	0	0	19561	0	0	40054
Backhoe	11661	10550	12216	24432	22211	48865	48865	46644	46643	46644	10550	12216	341497
Bore Rig	222105	200952	232681	232681	211528	232681	0	0	0	0	0	0	1332629
Dump Trucks	257902	233340	270183	540365	491242	1080731	1080732	1031608	1031607	1031606	233340	270183	7552838
Concrete Pump Truck	52368	0	54861	54861	0	54861	0	52368	0	52368	0	54861	376549
Concrete Mixer Truck	33430	30246	70044	105067	95515	140090	140089	133722	133721	133722	120986	105067	1241700
On-Site Truck Deliveries	94	57	132	164	120	197	197	220	188	220	142	164	1896
On-Road Truck Deliveries	8188	4939	11437	14296	20794	17155	34310	19104	16375	19104	12346	14296	192343
Worker Vehicles	207944	215017	238990	298737	252922	354098	384732	357522	300882	256642	206400	248967	3322853

TOTAL CO EMISSIONS FOR 2020	**16952317**	**g/year**
	18.681	**tons/year**

2020 HOBOKEN CO EMISSIONS WORKSHEET; Alternative 3, Option 2

2020

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	424993	384517	445231	445231	404755	445231	445231	424993	424993	424994	384518	445231	5099917
Crane	0	0	0	0	0	0	20493	0	0	19561	0	0	40054
Backhoe	34983	31651	36648	36648	22211	48865	48865	46644	46643	46644	10550	12216	422568
Bore Rig	0	200952	232681	232681	211528	232681	0	0	0	0	0	0	1110524
Dump Trucks	773706	700019	810549	810548	491242	1080731	1080732	1031608	1031607	1031606	233340	270183	9345870
Concrete Pump Truck	52368	0	54861	54861	0	54861	0	52368	0	52368	0	54861	376549
Concrete Mixer Truck	33430	30246	70044	140089	127354	175112	140089	133722	133721	133722	120986	105067	1343583
On-Site Truck Deliveries	94	57	132	197	150	230	197	220	188	220	142	164	1991
On-Road Truck Deliveries	8188	4939	11437	17155	25992	20014	34310	19104	16375	19104	12346	14296	203259
Worker Vehicles	207944	215017	238990	328611	281025	393442	341984	317798	267451	256642	206400	248967	3304269

TOTAL CO EMISSIONS FOR 2020	**21248585**	**g/year**
	23.416	**tons/year**

2020 AIR EMISSION WORKSHEETS

2020 HOBOKEN NOx EMISSIONS WORKSHEET; Alternative 1, Option 1

2020

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	419429	379483	439402	439402	399457	439402	439401	419429	419428	419429	379482	439402	5033146
Crane	0	0	0	0	0	0	72688	0	0	69384	0	0	142072
Backhoe	40041	36228	41948	83896	76269	83896	83896	80082	80082	80082	72455	41948	800823
Bore Rig	0	0	0	491801	447092	491801	491801	469446	0	0	0	0	2391941
Dump Trucks	189642	171581	198673	794690	722446	1192037	1192037	1137853	1137852	1137854	343162	397346	8615172
Concrete Pump Truck	53998	48855	56570	56569	51427	56569	56570	53998	53998	53998	48855	56570	647978
Concrete Mixer Truck	76828	69511	80487	321948	292679	321948	321948	307314	307313	76828	69511	80487	2326802
On-Site Truck Deliveries	343	311	360	972	844	955	922	886	938	330	306	360	7527
On-Road Truck Deliveries	30682	27760	32143	86843	75399	85344	82390	79169	83847	29480	27377	32143	672576
Worker Vehicles	16430	14866	23058	45029	41359	46115	40508	38346	27853	28670	24431	17213	363878

TOTAL NOx EMISSIONS FOR 2020	**21001915**	**g/year**
	23.144	**tons/year**

2020 HOBOKEN NOx EMISSIONS WORKSHEET; Alternative 1, Option 2

2020

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	419429	379483	439402	439402	399457	439402	439401	419429	419428	419429	379482	439402	5033146
Crane	0	0	0	72688	0	0	72688	0	0	69384	0	0	214761
Backhoe	40041	36228	41948	83896	76269	83896	83896	80082	80082	80082	72455	41948	800823
Bore Rig	0	0	0	491801	447092	491801	491801	469446	0	0	0	0	2391941
Dump Trucks	189642	171581	198673	794690	722446	1192037	1192037	1137853	1137852	1137854	343162	397346	8615172
Concrete Pump Truck	53998	48855	56570	56569	51427	56569	56570	53998	53998	53998	48855	56570	647978
Concrete Mixer Truck	76828	69511	80487	321948	292679	321948	321948	307314	307313	76828	69511	80487	2326802
On-Site Truck Deliveries	343	311	360	972	844	955	922	886	938	330	306	360	7527
On-Road Truck Deliveries	30682	27760	32143	86843	75399	85344	82390	79169	83847	29480	27377	32143	672576
Worker Vehicles	16430	14866	23058	45029	41359	46115	40508	38346	27853	28670	24431	17213	363878

TOTAL NOx EMISSIONS FOR 2020	**21074603**	**g/year**
	23.224	**tons/year**

2020 AIR EMISSION WORKSHEETS

2020 HOBOKEN NOx EMISSIONS WORKSHEET; Alternative 2, Option 1

2020

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	419429	379483	439402	439402	399457	439402	439401	419429	419428	419429	379482	439402	5033146
Crane	0	0	0	0	0	0	72688	0	0	69384	0	0	142072
Backhoe	13347	12076	13983	55930	50846	83896	83896	80082	80082	80082	24152	27965	606337
Bore Rig	234723	212369	245900	245900	0	0	0	0	0	0	0	0	938893
Dump Trucks	189642	171581	198673	794690	722446	1192037	1192037	1137853	1137852	1137854	343162	397346	8615172
Concrete Pump Truck	0	0	0	56569	51427	56569	56570	53998	53998	53998	48855	56570	488555
Concrete Mixer Truck	76828	69511	80487	321948	292679	321948	321948	307314	307313	76828	69511	80487	2326802
On-Site Truck Deliveries	258	233	270	972	844	875	845	812	860	330	306	360	6965
On-Road Truck Deliveries	23011	20820	24107	86843	75399	78232	75524	72572	76859	29480	27377	32143	622368
Worker Vehicles	21907	17343	20176	30957	21896	24414	24305	23008	22789	23457	19545	20082	269878

TOTAL NOx EMISSIONS FOR 2020	**19050188**	**g/year**
	20.993	**tons/year**

2020 HOBOKEN NOx EMISSIONS WORKSHEET; Alternative 2, Option 2

2020

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	419429	379483	439402	439402	399457	439402	439401	419429	419428	419429	379482	439402	5033146
Crane	0	0	0	0	0	0	72688	0	0	69384	0	0	142072
Backhoe	26694	24152	27965	41948	38134	83896	83896	80082	80082	80082	12076	13983	592990
Bore Rig	234723	212369	245900	245900	223546	0	0	0	0	0	0	0	1162439
Dump Trucks	379285	343162	397345	596018	541834	1192037	1192037	1137853	1137852	1137854	171581	198673	8425531
Concrete Pump Truck	0	0	0	56569	51427	56569	56570	53998	53998	53998	48855	56570	488555
Concrete Mixer Truck	76828	69511	80487	241461	219509	241461	241461	230485	230485	230485	208534	241460	2312167
On-Site Truck Deliveries	258	233	270	795	690	716	692	664	704	660	613	719	7014
On-Road Truck Deliveries	23011	20820	24107	71053	61690	64008	61792	59377	62885	58960	54755	64286	626744
Worker Vehicles	21907	17343	20176	30957	21896	24414	24305	23008	22789	23457	19545	20082	269878

TOTAL NOx EMISSIONS FOR 2020	**19060536**	**g/year**
	21.005	**tons/year**

2020 AIR EMISSION WORKSHEETS

2020 HOBOKEN NOx EMISSIONS WORKSHEET; Alternative 3, Option 1

2020

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	209715	189742	219701	219701	199728	219701	219701	209714	209714	209714	189741	219701	2516573
Crane	0	0	0	0	0	0	72688	0	0	69384	0	0	142072
Backhoe	13347	12076	13983	27965	25423	55931	55930	53388	53388	53388	12076	13983	390878
Bore Rig	234723	212369	245900	245900	223546	245900	0	0	0	0	0	0	1408339
Dump Trucks	189642	171581	198673	397345	361223	794691	794691	758569	758568	758569	171581	198673	5553806
Concrete Pump Truck	53998	0	56570	56569	0	56569	0	53998	0	53998	0	56570	388273
Concrete Mixer Truck	38414	34756	80487	120731	109755	160974	160974	153657	153656	153657	139023	120730	1426812
On-Site Truck Deliveries	258	155	360	442	307	478	461	517	469	577	383	450	4856
On-Road Truck Deliveries	23011	13880	32143	39474	27418	42672	41195	46182	41923	51590	34222	40179	433888
Worker Vehicles	19169	19821	23058	28143	21896	24414	24305	23008	22789	23457	19545	22951	272554

TOTAL NOx EMISSIONS FOR 2020	**12538052**	**g/year**
	13.817	**tons/year**

2020 HOBOKEN NOx EMISSIONS WORKSHEET; Alternative 3, Option 2

2020

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	419429	379483	439402	439402	399457	439402	439401	419429	419428	419429	379482	439402	5033146
Crane	0	0	0	0	0	0	72688	0	0	69384	0	0	142072
Backhoe	40041	36228	41948	41948	25423	55931	55930	53388	53388	53388	12076	13983	483672
Bore Rig	0	212369	245900	245900	223546	245900	0	0	0	0	0	0	1173616
Dump Trucks	568927	514743	596018	596018	361223	794691	794691	758569	758568	758569	171581	198673	6872271
Concrete Pump Truck	53998	0	56570	56569	0	56569	0	53998	0	53998	0	56570	388273
Concrete Mixer Truck	38414	34756	80487	160974	146339	201217	160974	153657	153656	153657	139023	120730	1543884
On-Site Truck Deliveries	258	155	360	530	384	557	461	517	469	577	383	450	5100
On-Road Truck Deliveries	23011	13880	32143	47369	34272	49784	41195	46182	41923	51590	34222	40179	455750
Worker Vehicles	19169	19821	23058	30957	24329	27126	21604	20451	20257	23457	19545	22951	272725

TOTAL NOx EMISSIONS FOR 2020	**16370508**	**g/year**
	18.040	**tons/year**

2020 AIR EMISSION WORKSHEETS

2020 HOBOKEN PM2.5 EMISSIONS WORKSHEET; Alternative 1, Option 1

2020

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	33061	29913	34636	34636	31487	34636	34636	33061	33061	33061	29913	34636	396737
Crane	0	0	0	0	0	0	2177	0	0	2078	0	0	4254
Backhoe	4617	4177	4836	9673	8793	9673	9673	9233	9233	9233	8354	4836	92332
Bore Rig	0	0	0	38324	34840	38324	38324	36582	0	0	0	0	186394
Dump Trucks	28271	25578	29617	118467	107698	177701	177701	169624	169624	169624	51156	59234	1284296
Concrete Pump Truck	4632	4191	4853	4853	4412	4853	4853	4632	4632	4632	4191	4853	55589
Concrete Mixer Truck	7323	6626	7672	30688	27898	30688	30688	29293	29293	7323	6626	7672	221791
On-Site Truck Deliveries	20	18	21	58	53	63	63	61	61	20	18	21	478
On-Road Truck Deliveries	1407	1273	1474	4054	3686	4423	4423	4222	4222	1407	1273	1474	33338
Worker Vehicles	1009	909	1375	2683	2544	2767	2433	2325	1723	1754	1464	1043	22028

TOTAL PM2.5 EMISSIONS FOR 2020	**2297238**	**g/year**
	2.532	**tons/year**

2020 HOBOKEN PM2.5 EMISSIONS WORKSHEET; Alternative 1, Option 2

2020

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	33061	29913	34636	34636	31487	34636	34636	33061	33061	33061	29913	34636	396737
Crane	0	0	0	2177	0	0	2177	0	0	2078	0	0	6431
Backhoe	4617	4177	4836	9673	8793	9673	9673	9233	9233	9233	8354	4836	92332
Bore Rig	0	0	0	38324	34840	38324	38324	36582	0	0	0	0	186394
Dump Trucks	28271	25578	29617	118467	107698	177701	177701	169624	169624	169624	51156	59234	1284296
Concrete Pump Truck	4632	4191	4853	4853	4412	4853	4853	4632	4632	4632	4191	4853	55589
Concrete Mixer Truck	7323	6626	7672	30688	27898	30688	30688	29293	29293	7323	6626	7672	221791
On-Site Truck Deliveries	20	18	21	58	53	63	63	61	61	20	18	21	478
On-Road Truck Deliveries	1407	1273	1474	4054	3686	4423	4423	4222	4222	1407	1273	1474	33338
Worker Vehicles	1009	909	1375	2683	2544	2767	2433	2325	1723	1754	1464	1043	22028

TOTAL PM2.5 EMISSIONS FOR 2020	**2299415**	**g/year**
	2.534	**tons/year**

2020 AIR EMISSION WORKSHEETS

2020 HOBOKEN PM2.5 EMISSIONS WORKSHEET; Alternative 2, Option 1

2020

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	33061	29913	34636	34636	31487	34636	34636	33061	33061	33061	29913	34636	396737
Crane	0	0	0	0	0	0	2177	0	0	2078	0	0	4254
Backhoe	1539	1392	1612	6449	5862	9673	9673	9233	9233	9233	2785	3224	69908
Bore Rig	18291	16549	19162	19162	0	0	0	0	0	0	0	0	73164
Dump Trucks	28271	25578	29617	118467	107698	177701	177701	169624	169624	169624	51156	59234	1284296
Concrete Pump Truck	0	0	0	4853	4412	4853	4853	4632	4632	4632	4191	4853	41913
Concrete Mixer Truck	7323	6626	7672	30688	27898	30688	30688	29293	29293	7323	6626	7672	221791
On-Site Truck Deliveries	15	14	16	58	53	58	58	56	56	20	18	21	443
On-Road Truck Deliveries	1055	955	1106	4054	3686	4054	4054	3870	3870	1407	1273	1474	30859
Worker Vehicles	1345	1060	1203	1845	1347	1465	1460	1395	1409	1435	1172	1217	16352

TOTAL PM2.5 EMISSIONS FOR 2020	**2139716**	**g/year**
	2.358	**tons/year**

2020 HOBOKEN PM2.5 EMISSIONS WORKSHEET; Alternative 2, Option 2

2020

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	33061	29913	34636	34636	31487	34636	34636	33061	33061	33061	29913	34636	396737
Crane	0	0	0	0	0	0	2177	0	0	2078	0	0	4254
Backhoe	3078	2785	3224	4836	4397	9673	9673	9233	9233	9233	1392	1612	68370
Bore Rig	18291	16549	19162	19162	17420	0	0	0	0	0	0	0	90584
Dump Trucks	56541	51156	59234	88851	80773	177701	177701	169624	169624	169624	25578	29617	1256025
Concrete Pump Truck	0	0	0	4853	4412	4853	4853	4632	4632	4632	4191	4853	41913
Concrete Mixer Truck	7323	6626	7672	23016	20924	23016	23016	21970	21970	21970	19877	23016	220396
On-Site Truck Deliveries	15	14	16	48	43	48	48	45	45	40	37	42	441
On-Road Truck Deliveries	1055	955	1106	3317	3015	3317	3317	3166	3166	2814	2546	2948	30725
Worker Vehicles	1345	1060	1203	1845	1347	1465	1460	1395	1409	1435	1172	1217	16352

TOTAL PM2.5 EMISSIONS FOR 2020	**2125796**	**g/year**
	2.343	**tons/year**

2020 AIR EMISSION WORKSHEETS

2020 HOBOKEN PM2.5 EMISSIONS WORKSHEET; Alternative 3, Option 1

2020

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	16531	14956	17318	17318	15744	17318	17318	16531	16531	16531	14956	17318	198368
Crane	0	0	0	0	0	0	2177	0	0	2078	0	0	4254
Backhoe	1539	1392	1612	3224	2931	6449	6449	6155	6155	6155	1392	1612	45067
Bore Rig	18291	16549	19162	19162	17420	19162	0	0	0	0	0	0	109746
Dump Trucks	28271	25578	29617	59234	53849	118467	118468	113083	113083	113083	25578	29617	827927
Concrete Pump Truck	4632	0	4853	4853	0	4853	0	4632	0	4632	0	4853	33309
Concrete Mixer Truck	3662	3313	7672	11508	10462	15344	15344	14647	14647	14647	13252	11508	136004
On-Site Truck Deliveries	15	9	21	26	19	32	32	35	30	35	23	26	305
On-Road Truck Deliveries	1055	637	1474	1843	1340	2211	2211	2463	2111	2463	1592	1843	21242
Worker Vehicles	1177	1212	1375	1677	1347	1465	1460	1395	1409	1435	1172	1391	16513

TOTAL PM2.5 EMISSIONS FOR 2020	**1392736**	**g/year**
	1.535	**tons/year**

2020 HOBOKEN PM2.5 EMISSIONS WORKSHEET; Alternative 3, Option 2

2020

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	33061	29913	34636	34636	31487	34636	34636	33061	33061	33061	29913	34636	396737
Crane	0	0	0	0	0	0	2177	0	0	2078	0	0	4254
Backhoe	4617	4177	4836	4836	2931	6449	6449	6155	6155	6155	1392	1612	55765
Bore Rig	0	16549	19162	19162	17420	19162	0	0	0	0	0	0	91455
Dump Trucks	84812	76735	88851	88851	53849	118467	118468	113083	113083	113083	25578	29617	1024475
Concrete Pump Truck	4632	0	4853	4853	0	4853	0	4632	0	4632	0	4853	33309
Concrete Mixer Truck	3662	3313	7672	15344	13949	19180	15344	14647	14647	14647	13252	11508	147163
On-Site Truck Deliveries	15	9	21	32	24	37	32	35	30	35	23	26	320
On-Road Truck Deliveries	1055	637	1474	2211	1675	2580	2211	2463	2111	2463	1592	1843	22315
Worker Vehicles	1177	1212	1375	1845	1496	1628	1297	1240	1253	1435	1172	1391	16520

TOTAL PM2.5 EMISSIONS FOR 2020	**1792314**	**g/year**
	1.975	**tons/year**

2020 AIR EMISSION WORKSHEETS

2020 HOBOKEN VOC EMISSIONS WORKSHEET; Alternative 1, Option 1

2020

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	58510	52938	61297	61297	55724	61297	61296	58510	58511	58511	52938	61297	702126
Crane	0	0	0	0	0	0	5165	0	0	4930	0	0	10095
Backhoe	5750	5202	6023	12047	10952	12047	12047	11499	11499	11499	10404	6023	114991
Bore Rig	0	0	0	67410	61282	67410	67410	64346	0	0	0	0	327859
Dump Trucks	45535	41199	47704	190814	173468	286221	286221	273211	273211	273212	82397	95407	2068600
Concrete Pump Truck	7827	7082	8200	8200	7455	8200	8200	7827	7827	7827	7082	8200	93929
Concrete Mixer Truck	11667	10556	12222	48890	44445	48890	48890	46668	46668	11667	10556	12222	353341
On-Site Truck Deliveries	45	41	47	130	118	142	142	136	135	45	41	47	1068
On-Road Truck Deliveries	2901	2625	3039	8359	7610	9162	9174	8753	8731	2901	2625	3039	68920
Worker Vehicles	2882	2616	4160	8420	8406	9857	8924	8445	5894	5545	4508	3036	72694

TOTAL VOC EMISSIONS FOR 2020	**3813624**	**g/year**
	4.203	**tons/year**

2020 HOBOKEN VOC EMISSIONS WORKSHEET; Alternative 1, Option 2

2020

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	58510	52938	61297	61297	55724	61297	61296	58510	58511	58511	52938	61297	702126
Crane	0	0	0	5165	0	0	5165	0	0	4930	0	0	15260
Backhoe	5750	5202	6023	12047	10952	12047	12047	11499	11499	11499	10404	6023	114991
Bore Rig	0	0	0	67410	61282	67410	67410	64346	0	0	0	0	327859
Dump Trucks	45535	41199	47704	190814	173468	286221	286221	273211	273211	273212	82397	95407	2068600
Concrete Pump Truck	7827	7082	8200	8200	7455	8200	8200	7827	7827	7827	7082	8200	93929
Concrete Mixer Truck	11667	10556	12222	48890	44445	48890	48890	46668	46668	11667	10556	12222	353341
On-Site Truck Deliveries	45	41	47	130	118	142	142	136	135	45	41	47	1068
On-Road Truck Deliveries	2901	2625	3039	8359	7610	9162	9174	8753	8731	2901	2625	3039	68920
Worker Vehicles	2882	2616	4160	8420	8406	9857	8924	8445	5894	5545	4508	3036	72694

TOTAL VOC EMISSIONS FOR 2020	**3818789**	**g/year**
	4.208	**tons/year**

2020 AIR EMISSION WORKSHEETS

2020 HOBOKEN VOC EMISSIONS WORKSHEET; Alternative 2, Option 1

2020

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	58510	52938	61297	61297	55724	61297	61296	58510	58511	58511	52938	61297	702126
Crane	0	0	0	0	0	0	5165	0	0	4930	0	0	10095
Backhoe	1917	1734	2008	8031	7301	12047	12047	11499	11499	11499	3468	4016	87065
Bore Rig	32173	29109	33705	33705	0	0	0	0	0	0	0	0	128692
Dump Trucks	45535	41199	47704	190814	173468	286221	286221	273211	273211	273212	82397	95407	2068600
Concrete Pump Truck	0	0	0	8200	7455	8200	8200	7827	7827	7827	7082	8200	70820
Concrete Mixer Truck	11667	10556	12222	48890	44445	48890	48890	46668	46668	11667	10556	12222	353341
On-Site Truck Deliveries	34	31	35	130	118	130	130	124	124	45	41	47	989
On-Road Truck Deliveries	2176	1969	2280	8359	7610	8399	8410	8024	8003	2901	2625	3039	63794
Worker Vehicles	3842	3052	3640	5788	4450	5219	5354	5067	4822	4537	3606	3543	52922

TOTAL VOC EMISSIONS FOR 2020	**3538443**	**g/year**
	3.899	**tons/year**

2020 HOBOKEN VOC EMISSIONS WORKSHEET; Alternative 2, Option 2

2020

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	58510	52938	61297	61297	55724	61297	61296	58510	58511	58511	52938	61297	702126
Crane	0	0	0	0	0	0	5165	0	0	4930	0	0	10095
Backhoe	3833	3468	4016	6023	5476	12047	12047	11499	11499	11499	1734	2008	85148
Bore Rig	32173	29109	33705	33705	30641	0	0	0	0	0	0	0	159333
Dump Trucks	91071	82397	95407	143110	130101	286221	286221	273211	273211	273212	41198	47704	2023065
Concrete Pump Truck	0	0	0	8200	7455	8200	8200	7827	7827	7827	7082	8200	70820
Concrete Mixer Truck	11667	10556	12222	36668	33334	36668	36668	35001	35001	35001	31667	36667	351119
On-Site Truck Deliveries	34	31	35	106	96	106	107	102	101	90	81	94	984
On-Road Truck Deliveries	2176	1969	2280	6839	6226	6872	6881	6565	6548	5803	5250	6079	63486
Worker Vehicles	3842	3052	3640	5788	4450	5219	5354	5067	4822	4537	3606	3543	52922

TOTAL VOC EMISSIONS FOR 2020	**3519098**	**g/year**
	3.878	**tons/year**

2020 AIR EMISSION WORKSHEETS

2020 HOBOKEN VOC EMISSIONS WORKSHEET; Alternative 3, Option 1

2020

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	29255	26469	30648	30648	27862	30648	30648	29255	29255	29255	26469	30648	351063
Crane	0	0	0	0	0	0	5165	0	0	4930	0	0	10095
Backhoe	1917	1734	2008	4016	3651	8031	8031	7666	7666	7666	1734	2008	56127
Bore Rig	32173	29109	33705	33705	30641	33705	0	0	0	0	0	0	193038
Dump Trucks	45535	41199	47704	95407	86734	190814	190814	182141	182141	182141	41198	47704	1333532
Concrete Pump Truck	7827	0	8200	8200	0	8200	0	7827	0	7827	0	8200	56283
Concrete Mixer Truck	5833	5278	12222	18334	16667	24445	24445	23334	23334	23334	21112	18334	216672
On-Site Truck Deliveries	34	20	47	59	43	71	71	79	68	79	51	59	680
On-Road Truck Deliveries	2176	1313	3039	3799	2767	4581	4587	5106	4365	5077	3281	3799	43892
Worker Vehicles	3362	3488	4160	5262	4450	5219	5354	5067	4822	4537	3606	4049	53377

TOTAL VOC EMISSIONS FOR 2020	**2314759**	**g/year**
	2.551	**tons/year**

2020 HOBOKEN VOC EMISSIONS WORKSHEET; Alternative 3, Option 2

2020

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	58510	52938	61297	61297	55724	61297	61296	58510	58511	58511	52938	61297	702126
Crane	0	0	0	0	0	0	5165	0	0	4930	0	0	10095
Backhoe	5750	5202	6023	6023	3651	8031	8031	7666	7666	7666	1734	2008	69451
Bore Rig	0	29109	33705	33705	30641	33705	0	0	0	0	0	0	160865
Dump Trucks	136606	123596	143111	143110	86734	190814	190814	182141	182141	182141	41198	47704	1650110
Concrete Pump Truck	7827	0	8200	8200	0	8200	0	7827	0	7827	0	8200	56283
Concrete Mixer Truck	5833	5278	12222	24445	22223	30556	24445	23334	23334	23334	21112	18334	234450
On-Site Truck Deliveries	34	20	47	71	54	83	71	79	68	79	51	59	715
On-Road Truck Deliveries	2176	1313	3039	4559	3459	5345	4587	5106	4365	5077	3281	3799	46107
Worker Vehicles	3362	3488	4160	5788	4945	5799	4759	4504	4286	4537	3606	4049	53284

TOTAL VOC EMISSIONS FOR 2020	**2983486**	**g/year**
	3.288	**tons/year**

2021 AIR EMISSION WORKSHEETS

2021 HOBOKEN CO EMISSIONS WORKSHEET; Alternative 1, Option 1

2021

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	384525	384525	465478	445239	404763	445240	425003	445241	425003	404764	404765	425001	5059545
Crane	0	0	0	17215	0	0	16433	0	0	0	15650	0	49299
Backhoe	29294	29294	35461	33919	51392	56532	53963	56532	53963	51393	41114	43170	536027
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	222778	222779	539358	1031817	1407022	1547723	1477374	1547725	1477374	1407022	938015	984915	12803902
Concrete Pump Truck	47372	47372	57345	54852	49866	54852	52359	54852	52359	49866	49865	52359	623319
Concrete Mixer Truck	60127	60127	72785	69621	63292	69621	66457	69621	66456	63292	63292	33228	757920
On-Site Truck Deliveries	99	99	150	143	130	143	137	143	137	130	130	109	1552
On-Road Truck Deliveries	8607	8607	13024	12458	22650	24915	11891	12458	11891	11325	11325	9513	158666
Worker Vehicles	153011	153011	178220	198883	240488	336792	388140	395847	317929	258290	206632	197304	3024547

TOTAL CO EMISSIONS FOR 2021	**23014776**	**g/year**
	25.362	**tons/year**

2021 HOBOKEN CO EMISSIONS WORKSHEET; Alternative 1, Option 2

2021

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	384525	384525	465478	445239	404763	445240	425003	445241	425003	404764	404765	425001	5059545
Crane	0	0	0	17215	0	0	16433	0	0	0	15650	0	49299
Backhoe	29294	29294	35461	33919	51392	56532	53963	56532	53963	51393	41114	43170	536027
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	222778	222779	539358	1031817	1407022	1547723	1477374	1547725	1477374	1407022	938015	984915	12803902
Concrete Pump Truck	47372	47372	57345	54852	49866	54852	52359	54852	52359	49866	49865	52359	623319
Concrete Mixer Truck	60127	60127	72785	69621	63292	69621	66457	69621	66456	63292	63292	33228	757920
On-Site Truck Deliveries	99	99	150	143	130	143	137	143	137	130	130	109	1552
On-Road Truck Deliveries	8607	8607	13024	12458	22650	24915	11891	12458	11891	11325	11325	9513	158666
Worker Vehicles	153011	153011	178220	198883	240488	336792	388140	395847	317929	258290	206632	197304	3024547

TOTAL CO EMISSIONS FOR 2021	**23014776**	**g/year**
	25.362	**tons/year**

2021 AIR EMISSION WORKSHEETS

2021 HOBOKEN CO EMISSIONS WORKSHEET; Alternative 2, Option 1

2021

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	384525	384525	465478	445239	404763	445240	425003	445241	425003	404764	404765	425001	5059545
Crane	0	0	0	0	0	0	16433	0	0	0	0	0	16433
Backhoe	9765	9765	23641	45225	61671	67838	64755	67839	64755	61671	41114	43170	561209
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	222778	222779	539358	1031817	1407022	1547723	1477374	1547725	1477374	1407022	938015	984915	12803902
Concrete Pump Truck	47372	47372	57345	0	0	0	52359	54852	52359	49866	49865	52359	463749
Concrete Mixer Truck	60127	60127	72785	69621	63292	69621	66457	69621	66456	63292	63292	33228	757920
On-Site Truck Deliveries	99	99	120	86	78	86	109	115	109	104	104	82	1192
On-Road Truck Deliveries	8607	8607	10419	7475	13590	14949	9513	9966	9513	9060	9060	7135	117896
Worker Vehicles	127509	127509	148517	198883	213767	299371	349326	316678	254344	206632	180803	140931	2564269

TOTAL CO EMISSIONS FOR 2021	**22346115**	**g/year**
	24.625	**tons/year**

2021 HOBOKEN CO EMISSIONS WORKSHEET; Alternative 2, Option 2

2021

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	384525	384525	465478	445239	404763	445240	425003	445241	425003	404764	404765	425001	5059545
Crane	0	0	0	0	0	0	16433	0	0	0	0	0	16433
Backhoe	9765	9765	11820	11306	61671	67838	64755	67839	64755	61671	20557	21585	473328
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	222778	222779	269679	257954	1407022	1547723	1477374	1547725	1477374	1407022	469008	492457	10798895
Concrete Pump Truck	47372	47372	57345	0	0	0	52359	54852	52359	49866	49865	52359	463749
Concrete Mixer Truck	60127	60127	72785	69621	63292	69621	132913	139242	132913	126583	126584	132913	1186722
On-Site Truck Deliveries	99	99	150	115	104	115	192	201	164	156	156	164	1715
On-Road Truck Deliveries	8607	8607	13024	9966	18120	19932	16648	17441	14270	13590	13590	14270	168066
Worker Vehicles	127509	127509	148517	198883	213767	299371	349326	316678	254344	206632	180803	140931	2564269

TOTAL CO EMISSIONS FOR 2021	**20732722**	**g/year**
	22.847	**tons/year**

2021 AIR EMISSION WORKSHEETS

2021 HOBOKEN CO EMISSIONS WORKSHEET; Alternative 3, Option 1

2021

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	192262	192263	232739	222620	202382	222620	212501	222620	212501	202382	202382	212501	2529773
Crane	0	0	0	0	0	0	16433	0	0	0	0	0	16433
Backhoe	9765	9765	11820	45225	41114	45226	43170	45226	43170	41114	30836	32377	398808
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	222778	222779	269679	1031817	938014	1031815	984916	1031817	984916	938015	703511	738686	9098744
Concrete Pump Truck	0	47372	57345	0	0	0	52359	0	52359	0	49865	52359	311659
Concrete Mixer Truck	30064	30064	36393	104432	126583	174053	132913	139242	132913	94937	63292	66457	1131341
On-Site Truck Deliveries	50	74	90	115	130	172	192	172	192	130	130	109	1556
On-Road Truck Deliveries	4304	6455	7814	9966	22650	29899	16648	14949	16648	11325	11325	9513	161498
Worker Vehicles	153011	153011	178220	227295	240488	336792	388140	356263	286136	232461	180803	140931	2873551

TOTAL CO EMISSIONS FOR 2021	**16523362**	**g/year**
	18.209	**tons/year**

2021 HOBOKEN CO EMISSIONS WORKSHEET; Alternative 3, Option 2

2021

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	384525	384525	232739	222620	202382	222620	425003	445241	425003	404764	404765	425001	4179185
Crane	0	0	0	0	0	0	16433	0	0	0	0	0	16433
Backhoe	9765	9765	11820	45225	41114	45226	43170	45226	43170	41114	30836	32377	398808
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	222778	222779	269679	1031817	938014	1031815	984916	1031817	984916	938015	703511	738686	9098744
Concrete Pump Truck	0	47372	57345	0	0	0	52359	0	52359	0	49865	52359	311659
Concrete Mixer Truck	30064	30064	36393	104432	126583	174053	132913	139242	132913	94937	63292	66457	1131341
On-Site Truck Deliveries	50	74	90	115	130	172	192	172	192	130	130	109	1556
On-Road Truck Deliveries	4304	6455	7814	9966	22650	29899	16648	14949	16648	11325	11325	9513	161498
Worker Vehicles	153011	153011	178220	227295	240488	336792	388140	356263	286136	232461	180803	140931	2873551

TOTAL CO EMISSIONS FOR 2021	**18172775**	**g/year**
	20.026	**tons/year**

2021 AIR EMISSION WORKSHEETS

2021 HOBOKEN NOx EMISSIONS WORKSHEET; Alternative 1, Option 1

2021

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	379483	379484	459375	439402	399456	439402	419428	439401	419428	399457	399456	419428	4993199
Crane	0	0	0	68900	0	0	65768	0	0	0	62636	0	197303
Backhoe	36125	36124	43730	41828	63376	69714	66545	69714	66545	63376	50701	53236	661014
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	165991	165991	401873	768800	1048364	1153199	1100782	1153200	1100783	1048363	698910	733853	9540108
Concrete Pump Truck	48533	48533	58750	56196	51087	56196	53642	56196	53642	51087	51087	53642	638592
Concrete Mixer Truck	67503	67503	81714	78161	71056	78161	74609	78161	74608	71056	71056	37304	850892
On-Site Truck Deliveries	273	273	413	388	337	350	322	340	344	345	354	302	4041
On-Road Truck Deliveries	24371	24371	36878	34656	60178	31219	28769	30340	30672	30811	31626	26937	390828
Worker Vehicles	13325	13325	16219	17673	19662	21924	23150	24051	22738	22268	18457	17182	229974

TOTAL NOx EMISSIONS FOR 2021	**17505951**	**g/year**
	19.292	**tons/year**

2021 HOBOKEN NOx EMISSIONS WORKSHEET; Alternative 1, Option 2

2021

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	379483	379484	459375	439402	399456	439402	419428	439401	419428	399457	399456	419428	4993199
Crane	0	0	0	68900	0	0	65768	0	0	0	62636	0	197303
Backhoe	36125	36124	43730	41828	63376	69714	66545	69714	66545	63376	50701	53236	661014
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	165991	165991	401873	768800	1048364	1153199	1100782	1153200	1100783	1048363	698910	733853	9540108
Concrete Pump Truck	48533	48533	58750	56196	51087	56196	53642	56196	53642	51087	51087	53642	638592
Concrete Mixer Truck	67503	67503	81714	78161	71056	78161	74609	78161	74608	71056	71056	37304	850892
On-Site Truck Deliveries	273	273	413	388	337	350	322	340	344	345	354	302	4041
On-Road Truck Deliveries	24371	24371	36878	34656	60178	31219	28769	30340	30672	30811	31626	26937	390828
Worker Vehicles	13325	13325	16219	17673	19662	21924	23150	24051	22738	22268	18457	17182	229974

TOTAL NOx EMISSIONS FOR 2021	**17505951**	**g/year**
	19.292	**tons/year**

2021 AIR EMISSION WORKSHEETS

2021 HOBOKEN NOx EMISSIONS WORKSHEET; Alternative 2, Option 1

2021

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	379483	379484	459375	439402	399456	439402	419428	439401	419428	399457	399456	419428	4993199
Crane	0	0	0	0	0	0	65768	0	0	0	0	0	65768
Backhoe	12042	12041	29153	55771	76051	83657	79854	83657	79854	76051	50701	53236	692069
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	165991	165991	401873	768800	1048364	1153199	1100782	1153200	1100783	1048363	698910	733853	9540108
Concrete Pump Truck	48533	48533	58750	0	0	0	53642	56196	53642	51087	51087	53642	475113
Concrete Mixer Truck	67503	67503	81714	78161	71056	78161	74609	78161	74608	71056	71056	37304	850892
On-Site Truck Deliveries	273	273	330	233	202	210	258	272	275	276	283	226	3112
On-Road Truck Deliveries	24371	24371	29502	20793	36107	18732	23015	24272	24537	24649	25301	20203	295853
Worker Vehicles	11104	11104	13516	17673	17477	19488	20835	19241	18191	17815	16149	12273	194865

TOTAL NOx EMISSIONS FOR 2021	**17110979**	**g/year**
	18.856	**tons/year**

2021 HOBOKEN NOx EMISSIONS WORKSHEET; Alternative 2, Option 2

2021

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	379483	379484	459375	439402	399456	439402	419428	439401	419428	399457	399456	419428	4993199
Crane	0	0	0	0	0	0	65768	0	0	0	0	0	65768
Backhoe	12042	12041	14577	13943	76051	83657	79854	83657	79854	76051	25351	26618	583695
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	165991	165991	200936	192200	1048364	1153199	1100782	1153200	1100783	1048363	349455	366927	8046191
Concrete Pump Truck	48533	48533	58750	0	0	0	53642	56196	53642	51087	51087	53642	475113
Concrete Mixer Truck	67503	67503	81714	78161	71056	78161	149217	156323	149217	142111	142111	149217	1332295
On-Site Truck Deliveries	273	273	413	311	270	280	451	476	412	414	425	453	4450
On-Road Truck Deliveries	24371	24371	36878	27725	48142	24976	40276	42476	36806	36974	37951	40405	421351
Worker Vehicles	11104	11104	13516	17673	17477	19488	20835	19241	18191	17815	16149	12273	194865

TOTAL NOx EMISSIONS FOR 2021	**16116926**	**g/year**
	17.761	**tons/year**

2021 AIR EMISSION WORKSHEETS

2021 HOBOKEN NOx EMISSIONS WORKSHEET; Alternative 3, Option 1

2021

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	189741	189742	229687	219701	199728	219701	209714	219701	209714	199728	199728	209714	2496599
Crane	0	0	0	0	0	0	65768	0	0	0	0	0	65768
Backhoe	12042	12041	14577	55771	50701	55771	53236	55771	53236	50701	38026	39927	491800
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	165991	165991	200936	768800	698909	768799	733855	768800	733855	698909	524182	550390	6779418
Concrete Pump Truck	0	48533	58750	0	0	0	53642	0	53642	0	51087	53642	319296
Concrete Mixer Truck	33751	33752	40857	117242	142111	195404	149217	156323	149217	106583	71056	74608	1270121
On-Site Truck Deliveries	136	205	248	311	337	420	451	408	481	345	354	302	3997
On-Road Truck Deliveries	12186	18279	22127	27725	60178	37463	40276	36408	42940	30811	31626	26937	386955
Worker Vehicles	13325	13325	16219	20198	19662	21924	23150	21646	20464	20041	16149	12273	218376

TOTAL NOx EMISSIONS FOR 2021	**12032330**	**g/year**
	13.260	**tons/year**

2021 HOBOKEN NOx EMISSIONS WORKSHEET; Alternative 3, Option 2

2021

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	379483	379484	229687	219701	199728	219701	419428	439401	419428	399457	399456	419428	4124382
Crane	0	0	0	0	0	0	65768	0	0	0	0	0	65768
Backhoe	12042	12041	14577	55771	50701	55771	53236	55771	53236	50701	38026	39927	491800
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	165991	165991	200936	768800	698909	768799	733855	768800	733855	698909	524182	550390	6779418
Concrete Pump Truck	0	48533	58750	0	0	0	53642	0	53642	0	51087	53642	319296
Concrete Mixer Truck	33751	33752	40857	117242	142111	195404	149217	156323	149217	106583	71056	74608	1270121
On-Site Truck Deliveries	136	205	248	311	337	420	451	408	481	345	354	302	3997
On-Road Truck Deliveries	12186	18279	22127	27725	60178	37463	40276	36408	42940	30811	31626	26937	386955
Worker Vehicles	13325	13325	16219	20198	19662	21924	23150	21646	20464	20041	16149	12273	218376

TOTAL NOx EMISSIONS FOR 2021	**13660113**	**g/year**
	15.053	**tons/year**

2021 AIR EMISSION WORKSHEETS

2021 HOBOKEN PM2.5 EMISSIONS WORKSHEET; Alternative 1, Option 1

2021

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	29914	29914	36212	34638	31489	34638	33063	34638	33063	31489	31489	33063	393609
Crane	0	0	0	1891	0	0	1805	0	0	0	1719	0	5414
Backhoe	3783	3783	4580	4381	6637	7301	6969	7301	6969	6637	5310	5575	69229
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	23678	23678	57325	109666	149544	164498	157021	164498	157021	149544	99696	104681	1360849
Concrete Pump Truck	4034	4034	4883	4670	4246	4670	4458	4670	4458	4246	4246	4458	53073
Concrete Mixer Truck	6313	6313	7642	7309	6645	7309	6977	7309	6977	6645	6645	3489	79573
On-Site Truck Deliveries	16	16	24	23	21	23	22	23	22	21	21	18	250
On-Road Truck Deliveries	1097	1097	1660	1588	1444	1588	1516	1588	1516	1444	1444	1213	17193
Worker Vehicles	882	879	1048	1147	1321	1441	1524	1599	1538	1485	1202	1126	15193

TOTAL PM2.5 EMISSIONS FOR 2021	**1994383**	**g/year**
	2.198	**tons/year**

2021 HOBOKEN PM2.5 EMISSIONS WORKSHEET; Alternative 1, Option 2

2021

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	29914	29914	36212	34638	31489	34638	33063	34638	33063	31489	31489	33063	393609
Crane	0	0	0	1891	0	0	1805	0	0	0	1719	0	5414
Backhoe	3783	3783	4580	4381	6637	7301	6969	7301	6969	6637	5310	5575	69229
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	23678	23678	57325	109666	149544	164498	157021	164498	157021	149544	99696	104681	1360849
Concrete Pump Truck	4034	4034	4883	4670	4246	4670	4458	4670	4458	4246	4246	4458	53073
Concrete Mixer Truck	6313	6313	7642	7309	6645	7309	6977	7309	6977	6645	6645	3489	79573
On-Site Truck Deliveries	16	16	24	23	21	23	22	23	22	21	21	18	250
On-Road Truck Deliveries	1097	1097	1660	1588	1444	1588	1516	1588	1516	1444	1444	1213	17193
Worker Vehicles	882	879	1048	1147	1321	1441	1524	1599	1538	1485	1202	1126	15193

TOTAL PM2.5 EMISSIONS FOR 2021	**1994383**	**g/year**
	2.198	**tons/year**

2021 AIR EMISSION WORKSHEETS

2021 HOBOKEN PM2.5 EMISSIONS WORKSHEET; Alternative 2, Option 1

2021

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	29914	29914	36212	34638	31489	34638	33063	34638	33063	31489	31489	33063	393609
Crane	0	0	0	0	0	0	1805	0	0	0	0	0	1805
Backhoe	1261	1261	3053	5841	7965	8761	8363	8761	8363	7965	5310	5575	72481
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	23678	23678	57325	109666	149544	164498	157021	164498	157021	149544	99696	104681	1360849
Concrete Pump Truck	4034	4034	4883	0	0	0	4458	4670	4458	4246	4246	4458	39486
Concrete Mixer Truck	6313	6313	7642	7309	6645	7309	6977	7309	6977	6645	6645	3489	79573
On-Site Truck Deliveries	16	16	19	14	13	14	18	18	18	17	17	13	192
On-Road Truck Deliveries	1097	1097	1328	953	866	953	1213	1270	1213	1155	1155	909	13208
Worker Vehicles	735	733	873	1147	1175	1281	1372	1279	1230	1188	1052	804	12869

TOTAL PM2.5 EMISSIONS FOR 2021	**1974073**	**g/year**
	2.175	**tons/year**

2021 HOBOKEN PM2.5 EMISSIONS WORKSHEET; Alternative 2, Option 2

2021

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	29914	29914	36212	34638	31489	34638	33063	34638	33063	31489	31489	33063	393609
Crane	0	0	0	0	0	0	1805	0	0	0	0	0	1805
Backhoe	1261	1261	1527	1460	7965	8761	8363	8761	8363	7965	2655	2788	61131
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	23678	23678	28663	27416	149544	164498	157021	164498	157021	149544	49848	52340	1147749
Concrete Pump Truck	4034	4034	4883	0	0	0	4458	4670	4458	4246	4246	4458	39486
Concrete Mixer Truck	6313	6313	7642	7309	6645	7309	13954	14619	13954	13290	13290	13954	124592
On-Site Truck Deliveries	16	16	24	18	17	18	31	32	26	25	25	26	277
On-Road Truck Deliveries	1097	1097	1660	1270	1155	1270	2122	2223	1819	1732	1732	1819	18997
Worker Vehicles	735	733	873	1147	1175	1281	1372	1279	1230	1188	1052	804	12869

TOTAL PM2.5 EMISSIONS FOR 2021	**1800515**	**g/year**
	1.984	**tons/year**

2021 AIR EMISSION WORKSHEETS

2021 HOBOKEN PM2.5 EMISSIONS WORKSHEET; Alternative 3, Option 1

2021

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	14957	14957	18106	17319	15744	17319	16532	17319	16532	15744	15744	16532	196804
Crane	0	0	0	0	0	0	1805	0	0	0	0	0	1805
Backhoe	1261	1261	1527	5841	5310	5841	5575	5841	5575	5310	3982	4182	51507
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	23678	23678	28663	109666	99696	109665	104681	109666	104681	99696	74772	78510	967050
Concrete Pump Truck	0	4034	4883	0	0	0	4458	0	4458	0	4246	4458	26536
Concrete Mixer Truck	3156	3156	3821	10964	13290	18274	13954	14619	13954	9967	6645	6977	118778
On-Site Truck Deliveries	8	12	15	18	21	28	31	28	31	21	21	18	251
On-Road Truck Deliveries	549	823	996	1270	1444	1905	2122	1905	2122	1444	1444	1213	17236
Worker Vehicles	882	879	1048	1311	1321	1441	1524	1439	1384	1337	1052	804	14423

TOTAL PM2.5 EMISSIONS FOR 2021	**1394390**	**g/year**
	1.537	**tons/year**

2021 HOBOKEN PM2.5 EMISSIONS WORKSHEET; Alternative 3, Option 2

2021

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	29914	29914	18106	17319	15744	17319	33063	34638	33063	31489	31489	33063	325121
Crane	0	0	0	0	0	0	1805	0	0	0	0	0	1805
Backhoe	1261	1261	1527	5841	5310	5841	5575	5841	5575	5310	3982	4182	51507
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	23678	23678	28663	109666	99696	109665	104681	109666	104681	99696	74772	78510	967050
Concrete Pump Truck	0	4034	4883	0	0	0	4458	0	4458	0	4246	4458	26536
Concrete Mixer Truck	3156	3156	3821	10964	13290	18274	13954	14619	13954	9967	6645	6977	118778
On-Site Truck Deliveries	8	12	15	18	21	28	31	28	31	21	21	18	251
On-Road Truck Deliveries	549	823	996	1270	1444	1905	2122	1905	2122	1444	1444	1213	17236
Worker Vehicles	882	879	1048	1311	1321	1441	1524	1439	1384	1337	1052	804	14423

TOTAL PM2.5 EMISSIONS FOR 2021	**1522707**	**g/year**
	1.678	**tons/year**

2021 AIR EMISSION WORKSHEETS

2021 HOBOKEN VOC EMISSIONS WORKSHEET; Alternative 1, Option 1

2021

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	52938	52938	64083	61297	55725	61297	58511	61297	58511	55725	55725	58511	696557
Crane	0	0	0	4924	0	0	4700	0	0	0	4476	0	14100
Backhoe	4738	4738	5735	5486	8312	9143	8727	9143	8727	8312	6650	6982	86693
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	38294	38294	92711	177360	241856	266041	253949	266041	253948	241855	161237	169299	2200885
Concrete Pump Truck	6978	6978	8447	8080	7345	8080	7713	8080	7713	7345	7345	7713	91818
Concrete Mixer Truck	10186	10186	12330	11794	10722	11794	11258	11794	11258	10722	10722	5629	128394
On-Site Truck Deliveries	34	34	51	49	45	49	47	50	47	45	45	38	534
On-Road Truck Deliveries	2197	2197	3324	3180	2895	3198	3057	3201	3046	2891	2891	2428	34504
Worker Vehicles	2318	2325	2911	3284	3987	4674	5086	5283	4800	4280	3386	3005	45338

TOTAL VOC EMISSIONS FOR 2021	**3298823**	**g/year**
	3.635	**tons/year**

2021 HOBOKEN VOC EMISSIONS WORKSHEET; Alternative 1, Option 2

2021

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	52938	52938	64083	61297	55725	61297	58511	61297	58511	55725	55725	58511	696557
Crane	0	0	0	4924	0	0	4700	0	0	0	4476	0	14100
Backhoe	4738	4738	5735	5486	8312	9143	8727	9143	8727	8312	6650	6982	86693
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	38294	38294	92711	177360	241856	266041	253949	266041	253948	241855	161237	169299	2200885
Concrete Pump Truck	6978	6978	8447	8080	7345	8080	7713	8080	7713	7345	7345	7713	91818
Concrete Mixer Truck	10186	10186	12330	11794	10722	11794	11258	11794	11258	10722	10722	5629	128394
On-Site Truck Deliveries	34	34	51	49	45	49	47	50	47	45	45	38	534
On-Road Truck Deliveries	2197	2197	3324	3180	2895	3198	3057	3201	3046	2891	2891	2428	34504
Worker Vehicles	2318	2325	2911	3284	3987	4674	5086	5283	4800	4280	3386	3005	45338

TOTAL VOC EMISSIONS FOR 2021	**3298823**	**g/year**
	3.635	**tons/year**

2021 AIR EMISSION WORKSHEETS

2021 HOBOKEN VOC EMISSIONS WORKSHEET; Alternative 2, Option 1

2021

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	52938	52938	64083	61297	55725	61297	58511	61297	58511	55725	55725	58511	696557
Crane	0	0	0	0	0	0	4700	0	0	0	0	0	4700
Backhoe	1579	1579	3823	7314	9974	10972	10473	10972	10473	9974	6650	6982	90766
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	38294	38294	92711	177360	241856	266041	253949	266041	253948	241855	161237	169299	2200885
Concrete Pump Truck	6978	6978	8447	0	0	0	7713	8080	7713	7345	7345	7713	68313
Concrete Mixer Truck	10186	10186	12330	11794	10722	11794	11258	11794	11258	10722	10722	5629	128394
On-Site Truck Deliveries	34	34	41	30	27	30	38	40	38	36	36	28	410
On-Road Truck Deliveries	2197	2197	2659	1908	1737	1919	2446	2561	2437	2312	2312	1821	26506
Worker Vehicles	1931	1937	2426	3284	3544	4155	4577	4226	3840	3424	2963	2146	38454

TOTAL VOC EMISSIONS FOR 2021	**3254984**	**g/year**
	3.587	**tons/year**

2021 HOBOKEN VOC EMISSIONS WORKSHEET; Alternative 2, Option 2

2021

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	52938	52938	64083	61297	55725	61297	58511	61297	58511	55725	55725	58511	696557
Crane	0	0	0	0	0	0	4700	0	0	0	0	0	4700
Backhoe	1579	1579	1912	1829	9974	10972	10473	10972	10473	9974	3325	3491	76552
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	38294	38294	46356	44340	241856	266041	253949	266041	253948	241855	80618	84649	1856241
Concrete Pump Truck	6978	6978	8447	0	0	0	7713	8080	7713	7345	7345	7713	68313
Concrete Mixer Truck	10186	10186	12330	11794	10722	11794	22516	23588	22516	21444	21444	22516	201035
On-Site Truck Deliveries	34	34	51	39	36	40	66	69	57	54	54	56	590
On-Road Truck Deliveries	2197	2197	3324	2544	2316	2558	4280	4481	3655	3469	3469	3642	38132
Worker Vehicles	1931	1937	2426	3284	3544	4155	4577	4226	3840	3424	2963	2146	38454

TOTAL VOC EMISSIONS FOR 2021	**2980574**	**g/year**
	3.285	**tons/year**

2021 AIR EMISSION WORKSHEETS

2021 HOBOKEN VOC EMISSIONS WORKSHEET; Alternative 3, Option 1

2021

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	26469	26469	32042	30648	27862	30649	29255	30649	29255	27862	27862	29255	348279
Crane	0	0	0	0	0	0	4700	0	0	0	0	0	4700
Backhoe	1579	1579	1912	7314	6649	7314	6982	7314	6982	6650	4987	5236	64500
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	38294	38294	46356	177360	161237	177361	169299	177361	169299	161237	120928	126974	1563999
Concrete Pump Truck	0	6978	8447	0	0	0	7713	0	7713	0	7345	7713	45909
Concrete Mixer Truck	5093	5093	6165	17691	21444	29485	22516	23588	22516	16083	10722	11258	191653
On-Site Truck Deliveries	17	26	31	39	45	59	66	59	66	45	45	38	536
On-Road Truck Deliveries	1098	1648	1994	2544	2895	3837	4280	3841	4265	2891	2891	2428	34611
Worker Vehicles	2318	2325	2911	3753	3987	4674	5086	4754	4320	3852	2963	2146	43089

TOTAL VOC EMISSIONS FOR 2021	**2297276**	**g/year**
	2.532	**tons/year**

2021 HOBOKEN VOC EMISSIONS WORKSHEET; Alternative 3, Option 2

2021

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	52938	52938	32042	30648	27862	30649	58511	61297	58511	55725	55725	58511	575356
Crane	0	0	0	0	0	0	4700	0	0	0	0	0	4700
Backhoe	1579	1579	1912	7314	6649	7314	6982	7314	6982	6650	4987	5236	64500
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	38294	38294	46356	177360	161237	177361	169299	177361	169299	161237	120928	126974	1563999
Concrete Pump Truck	0	6978	8447	0	0	0	7713	0	7713	0	7345	7713	45909
Concrete Mixer Truck	5093	5093	6165	17691	21444	29485	22516	23588	22516	16083	10722	11258	191653
On-Site Truck Deliveries	17	26	31	39	45	59	66	59	66	45	45	38	536
On-Road Truck Deliveries	1098	1648	1994	2544	2895	3837	4280	3841	4265	2891	2891	2428	34611
Worker Vehicles	2318	2325	2911	3753	3987	4674	5086	4754	4320	3852	2963	2146	43089

TOTAL VOC EMISSIONS FOR 2021	**2524353**	**g/year**
	2.782	**tons/year**

2022 AIR EMISSION WORKSHEETS

2022 HOBOKEN CO EMISSIONS WORKSHEET; Alternative 1, Option 1

2022

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	404771	384532	465487	425009	425009	222625	404771	0	0	0	0	0	2732203
Crane	0	0	0	0	0	0	12821	0	0	0	0	0	12821
Backhoe	28453	27030	32720	29875	29875	20865	28452	0	0	0	0	0	197271
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	449058	426605	516417	471511	471511	0	0	0	0	0	0	0	2335103
Concrete Pump Truck	49867	47374	57348	52361	52361	54854	49867	0	0	0	0	0	364032
Concrete Mixer Truck	31537	29960	36268	33114	33114	34691	31537	0	0	0	0	0	230221
On-Site Truck Deliveries	93	88	106	97	97	51	46	0	0	0	0	0	579
On-Road Truck Deliveries	8043	7641	9249	8445	8445	4423	4021	0	0	0	0	0	50267
Worker Vehicles	151856	144263	168333	179311	185475	106049	209532	0	0	0	0	0	1144818

TOTAL CO EMISSIONS FOR 2022	**7067315**	**g/year**
	7.788	**tons/year**

2022 HOBOKEN CO EMISSIONS WORKSHEET; Alternative 1, Option 2

2022

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	404771	384532	465487	425009	425009	222625	404771	0	0	0	0	0	2732203
Crane	0	0	0	0	0	0	12821	0	0	0	0	0	12821
Backhoe	28453	27030	32720	29875	29875	20865	18968	0	0	0	0	0	187787
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	449058	426605	516417	471511	471511	0	0	0	0	0	0	0	2335103
Concrete Pump Truck	49867	47374	57348	52361	52361	54854	49867	0	0	0	0	0	364032
Concrete Mixer Truck	31537	29960	36268	33114	33114	34691	31537	0	0	0	0	0	230221
On-Site Truck Deliveries	93	88	106	97	97	51	46	0	0	0	0	0	579
On-Road Truck Deliveries	8043	7641	9249	8445	8445	4423	4021	0	0	0	0	0	50267
Worker Vehicles	151856	144263	168333	179311	185475	106049	209532	0	0	0	0	0	1144818

TOTAL CO EMISSIONS FOR 2022	**7057831**	**g/year**
	7.778	**tons/year**

2022 AIR EMISSION WORKSHEETS

2022 HOBOKEN CO EMISSIONS WORKSHEET; Alternative 2, Option 1

2022

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	202385	192266	465487	425009	425009	445249	404771	0	0	0	0	0	2560176
Crane	0	0	0	0	13462	0	0	0	0	0	0	0	13462
Backhoe	18968	18020	21814	19917	19917	20865	9484	0	0	0	0	0	128985
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	449058	426605	516417	471511	471511	0	0	0	0	0	0	0	2335103
Concrete Pump Truck	49867	47374	57348	52361	52361	0	0	0	0	0	0	0	259311
Concrete Mixer Truck	31537	29960	36268	33114	33114	34691	31537	0	0	0	0	0	230221
On-Site Truck Deliveries	69	66	80	73	73	25	23	0	0	0	0	0	410
On-Road Truck Deliveries	6032	5730	6937	6334	6334	2212	2011	0	0	0	0	0	35589
Worker Vehicles	101237	96175	112222	153695	185475	35350	34922	0	0	0	0	0	719076

TOTAL CO EMISSIONS FOR 2022	**6282333**	**g/year**
	6.923	**tons/year**

2022 HOBOKEN CO EMISSIONS WORKSHEET; Alternative 2, Option 2

2022

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	202385	192266	465487	425009	425009	445249	404771	0	0	0	0	0	2560176
Crane	0	0	0	0	13462	0	0	0	0	0	0	0	13462
Backhoe	18968	18020	21814	19917	19917	20865	9484	0	0	0	0	0	128985
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	449058	426605	516417	471511	471511	0	0	0	0	0	0	0	2335103
Concrete Pump Truck	49867	47374	57348	52361	52361	0	0	0	0	0	0	0	259311
Concrete Mixer Truck	94611	89881	108803	99342	99342	69382	63074	0	0	0	0	0	624434
On-Site Truck Deliveries	116	110	133	146	146	51	46	0	0	0	0	0	747
On-Road Truck Deliveries	10053	9551	11561	12667	12667	4423	4021	0	0	0	0	0	64945
Worker Vehicles	101237	96175	112222	153695	185475	35350	34922	0	0	0	0	0	719076

TOTAL CO EMISSIONS FOR 2022	**6706240**	**g/year**
	7.390	**tons/year**

2022 AIR EMISSION WORKSHEETS

2022 HOBOKEN CO EMISSIONS WORKSHEET; Alternative 3, Option 1

2022

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	202385	192266	232743	212505	212505	222625	0	0	0	0	0	0	1275028
Crane	0	0	14744	0	0	0	0	0	0	0	0	0	14744
Backhoe	18968	9010	10907	9958	9958	10433	0	0	0	0	0	0	69234
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	449058	426605	516417	471511	471511	0	0	0	0	0	0	0	2335103
Concrete Pump Truck	49867	0	57348	0	0	0	0	0	0	0	0	0	107215
Concrete Mixer Truck	63074	59920	72535	0	0	0	0	0	0	0	0	0	195530
On-Site Truck Deliveries	93	44	106	0	0	0	0	0	0	0	0	0	243
On-Road Truck Deliveries	8043	3820	9249	0	0	0	0	0	0	0	0	0	21112
Worker Vehicles	126546	120219	168333	25616	26496	35350	0	0	0	0	0	0	502560

TOTAL CO EMISSIONS FOR 2022	**4520770**	**g/year**
	4.982	**tons/year**

2022 HOBOKEN CO EMISSIONS WORKSHEET; Alternative 3, Option 2

2022

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	202385	192266	465487	425009	425009	445249	404771	0	0	0	0	0	2560176
Crane	0	0	14744	0	0	0	0	0	0	0	0	0	14744
Backhoe	18968	9010	10907	9958	9958	10433	0	0	0	0	0	0	69234
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	449058	426605	516417	471511	471511	0	0	0	0	0	0	0	2335103
Concrete Pump Truck	49867	0	57348	0	0	0	0	0	0	0	0	0	107215
Concrete Mixer Truck	63074	59920	72535	0	0	0	0	0	0	0	0	0	195530
On-Site Truck Deliveries	93	44	106	0	0	0	0	0	0	0	0	0	243
On-Road Truck Deliveries	8043	3820	9249	0	0	0	0	0	0	0	0	0	21112
Worker Vehicles	126546	120219	168333	25616	26496	35350	0	0	0	0	0	0	502560

TOTAL CO EMISSIONS FOR 2022	**5805919**	**g/year**
	6.398	**tons/year**

2022 AIR EMISSION WORKSHEETS

2022 HOBOKEN NOx EMISSIONS WORKSHEET; Alternative 1, Option 1

2022

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	399457	379483	459375	419429	419429	219701	399457	0	0	0	0	0	2696331
Crane	0	0	0	0	0	0	59442	0	0	0	0	0	59442
Backhoe	37942	36045	43633	39839	39839	27824	37942	0	0	0	0	0	263062
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	340537	323511	391618	357564	357564	0	0	0	0	0	0	0	1770794
Concrete Pump Truck	50811	48271	58433	53352	53352	55892	50811	0	0	0	0	0	370921
Concrete Mixer Truck	34772	33033	39987	36510	36510	38249	34772	0	0	0	0	0	253832
On-Site Truck Deliveries	254	241	292	262	250	124	108	0	0	0	0	0	1531
On-Road Truck Deliveries	22649	21516	26046	23364	44627	11025	9676	0	0	0	0	0	158902
Worker Vehicles	12551	11924	14524	15106	14390	6550	11856	0	0	0	0	0	86901

TOTAL NOx EMISSIONS FOR 2022	**5661715**	**g/year**
	6.239	**tons/year**

2022 HOBOKEN NOx EMISSIONS WORKSHEET; Alternative 1, Option 2

2022

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	399457	379483	459375	419429	419429	219701	399457	0	0	0	0	0	2696331
Crane	0	0	0	0	0	0	59442	0	0	0	0	0	59442
Backhoe	37942	36045	43633	39839	39839	27824	25294	0	0	0	0	0	250415
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	340537	323511	391618	357564	357564	0	0	0	0	0	0	0	1770794
Concrete Pump Truck	50811	48271	58433	53352	53352	55892	50811	0	0	0	0	0	370921
Concrete Mixer Truck	34772	33033	39987	36510	36510	38249	34772	0	0	0	0	0	253832
On-Site Truck Deliveries	254	241	292	262	250	124	108	0	0	0	0	0	1531
On-Road Truck Deliveries	22649	21516	26046	23364	44627	11025	9676	0	0	0	0	0	158902
Worker Vehicles	12551	11924	14524	15106	14390	6550	11856	0	0	0	0	0	86901

TOTAL NOx EMISSIONS FOR 2022	**5649068**	**g/year**
	6.225	**tons/year**

2022 AIR EMISSION WORKSHEETS

2022 HOBOKEN NOx EMISSIONS WORKSHEET; Alternative 2, Option 1

2022

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	199728	189741	459375	419429	419429	439402	399457	0	0	0	0	0	2526562
Crane	0	0	0	0	62414	0	0	0	0	0	0	0	62414
Backhoe	25294	24030	29089	26559	26559	27824	12647	0	0	0	0	0	172002
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	340537	323511	391618	357564	357564	0	0	0	0	0	0	0	1770794
Concrete Pump Truck	50811	48271	58433	53352	53352	0	0	0	0	0	0	0	264218
Concrete Mixer Truck	34772	33033	39987	36510	36510	38249	34772	0	0	0	0	0	253832
On-Site Truck Deliveries	190	181	219	196	188	62	54	0	0	0	0	0	1090
On-Road Truck Deliveries	16986	16137	19534	17523	33470	5512	4838	0	0	0	0	0	114001
Worker Vehicles	8367	7949	9682	12948	14390	2183	1976	0	0	0	0	0	57496

TOTAL NOx EMISSIONS FOR 2022	**5222409**	**g/year**
	5.755	**tons/year**

2022 HOBOKEN NOx EMISSIONS WORKSHEET; Alternative 2, Option 2

2022

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	199728	189741	459375	419429	419429	439402	399457	0	0	0	0	0	2526562
Crane	0	0	0	0	62414	0	0	0	0	0	0	0	62414
Backhoe	25294	24030	29089	26559	26559	27824	12647	0	0	0	0	0	172002
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	340537	323511	391618	357564	357564	0	0	0	0	0	0	0	1770794
Concrete Pump Truck	50811	48271	58433	53352	53352	0	0	0	0	0	0	0	264218
Concrete Mixer Truck	104315	99099	119961	109530	109530	76498	69543	0	0	0	0	0	688476
On-Site Truck Deliveries	317	301	365	393	375	124	108	0	0	0	0	0	1983
On-Road Truck Deliveries	28311	26895	32557	35046	66941	11025	9676	0	0	0	0	0	210450
Worker Vehicles	8367	7949	9682	12948	14390	2183	1976	0	0	0	0	0	57496

TOTAL NOx EMISSIONS FOR 2022	**5754395**	**g/year**
	6.341	**tons/year**

2022 AIR EMISSION WORKSHEETS

2022 HOBOKEN NOx EMISSIONS WORKSHEET; Alternative 3, Option 1

2022

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	199728	189741	229687	209715	209714	219701	0	0	0	0	0	0	1258287
Crane	0	0	68358	0	0	0	0	0	0	0	0	0	68358
Backhoe	25294	12015	14544	13280	13280	13912	0	0	0	0	0	0	92325
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	340537	323511	391618	357564	357564	0	0	0	0	0	0	0	1770794
Concrete Pump Truck	50811	0	58433	0	0	0	0	0	0	0	0	0	109244
Concrete Mixer Truck	69543	66066	79974	0	0	0	0	0	0	0	0	0	215583
On-Site Truck Deliveries	254	121	292	0	0	0	0	0	0	0	0	0	666
On-Road Truck Deliveries	22649	10758	26046	0	0	0	0	0	0	0	0	0	59452
Worker Vehicles	10459	9936	14524	2158	2056	2183	0	0	0	0	0	0	41316

TOTAL NOx EMISSIONS FOR 2022	**3616026**	**g/year**
	3.985	**tons/year**

2022 HOBOKEN NOx EMISSIONS WORKSHEET; Alternative 3, Option 2

2022

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	199728	189741	459375	419429	419429	439402	399457	0	0	0	0	0	2526562
Crane	0	0	68358	0	0	0	0	0	0	0	0	0	68358
Backhoe	25294	12015	14544	13280	13280	13912	0	0	0	0	0	0	92325
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	340537	323511	391618	357564	357564	0	0	0	0	0	0	0	1770794
Concrete Pump Truck	50811	0	58433	0	0	0	0	0	0	0	0	0	109244
Concrete Mixer Truck	69543	66066	79974	0	0	0	0	0	0	0	0	0	215583
On-Site Truck Deliveries	254	121	292	0	0	0	0	0	0	0	0	0	666
On-Road Truck Deliveries	22649	10758	26046	0	0	0	0	0	0	0	0	0	59452
Worker Vehicles	10459	9936	14524	2158	2056	2183	0	0	0	0	0	0	41316

TOTAL NOx EMISSIONS FOR 2022	**4884300**	**g/year**
	5.382	**tons/year**

2022 AIR EMISSION WORKSHEETS

2022 HOBOKEN PM2.5 EMISSIONS WORKSHEET; Alternative 1, Option 1

2022

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	31490	29916	36214	33065	33065	17320	31490	0	0	0	0	0	212559
Crane	0	0	0	0	0	0	1572	0	0	0	0	0	1572
Backhoe	3582	3403	4120	3761	3761	2627	3582	0	0	0	0	0	24837
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	46638	44307	53634	48970	48970	0	0	0	0	0	0	0	242520
Concrete Pump Truck	4103	3898	4718	4308	4308	4513	4103	0	0	0	0	0	29951
Concrete Mixer Truck	3204	3044	3685	3364	3364	3525	3204	0	0	0	0	0	23390
On-Site Truck Deliveries	15	14	17	15	15	8	7	0	0	0	0	0	92
On-Road Truck Deliveries	995	945	1144	1044	1044	547	497	0	0	0	0	0	6217
Worker Vehicles	902	855	1022	1072	1060	473	857	0	0	0	0	0	6242

TOTAL PM2.5 EMISSIONS FOR 2022	**547379**	**g/year**
	0.603	**tons/year**

2022 HOBOKEN PM2.5 EMISSIONS WORKSHEET; Alternative 1, Option 2

2022

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	31490	29916	36214	33065	33065	17320	31490	0	0	0	0	0	212559
Crane	0	0	0	0	0	0	1572	0	0	0	0	0	1572
Backhoe	3582	3403	4120	3761	3761	2627	2388	0	0	0	0	0	23643
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	46638	44307	53634	48970	48970	0	0	0	0	0	0	0	242520
Concrete Pump Truck	4103	3898	4718	4308	4308	4513	4103	0	0	0	0	0	29951
Concrete Mixer Truck	3204	3044	3685	3364	3364	3525	3204	0	0	0	0	0	23390
On-Site Truck Deliveries	15	14	17	15	15	8	7	0	0	0	0	0	92
On-Road Truck Deliveries	995	945	1144	1044	1044	547	497	0	0	0	0	0	6217
Worker Vehicles	902	855	1022	1072	1060	473	857	0	0	0	0	0	6242

TOTAL PM2.5 EMISSIONS FOR 2022	**546185**	**g/year**
	0.602	**tons/year**

2022 AIR EMISSION WORKSHEETS

2022 HOBOKEN PM2.5 EMISSIONS WORKSHEET; Alternative 2, Option 1

2022

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	15745	14958	36214	33065	33065	34639	31490	0	0	0	0	0	199175
Crane	0	0	0	0	1650	0	0	0	0	0	0	0	1650
Backhoe	2388	2269	2746	2508	2508	2627	1194	0	0	0	0	0	16239
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	46638	44307	53634	48970	48970	0	0	0	0	0	0	0	242520
Concrete Pump Truck	4103	3898	4718	4308	4308	0	0	0	0	0	0	0	21335
Concrete Mixer Truck	3204	3044	3685	3364	3364	3525	3204	0	0	0	0	0	23390
On-Site Truck Deliveries	11	10	13	12	12	4	4	0	0	0	0	0	65
On-Road Truck Deliveries	746	709	858	783	783	274	249	0	0	0	0	0	4402
Worker Vehicles	601	570	681	919	1060	158	143	0	0	0	0	0	4132

TOTAL PM2.5 EMISSIONS FOR 2022	**512909**	**g/year**
	0.565	**tons/year**

2022 HOBOKEN PM2.5 EMISSIONS WORKSHEET; Alternative 2, Option 2

2022

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	15745	14958	36214	33065	33065	34639	31490	0	0	0	0	0	199175
Crane	0	0	0	0	1650	0	0	0	0	0	0	0	1650
Backhoe	2388	2269	2746	2508	2508	2627	1194	0	0	0	0	0	16239
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	46638	44307	53634	48970	48970	0	0	0	0	0	0	0	242520
Concrete Pump Truck	4103	3898	4718	4308	4308	0	0	0	0	0	0	0	21335
Concrete Mixer Truck	9612	9132	11054	10093	10093	7049	6408	0	0	0	0	0	63441
On-Site Truck Deliveries	18	17	21	23	23	8	7	0	0	0	0	0	119
On-Road Truck Deliveries	1243	1181	1430	1567	1567	547	497	0	0	0	0	0	8032
Worker Vehicles	601	570	681	919	1060	158	143	0	0	0	0	0	4132

TOTAL PM2.5 EMISSIONS FOR 2022	**556645**	**g/year**
	0.613	**tons/year**

2022 AIR EMISSION WORKSHEETS

2022 HOBOKEN PM2.5 EMISSIONS WORKSHEET; Alternative 3, Option 1

2022

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	15745	14958	18107	16532	16532	17320	0	0	0	0	0	0	99194
Crane	0	0	1807	0	0	0	0	0	0	0	0	0	1807
Backhoe	2388	1134	1373	1254	1254	1313	0	0	0	0	0	0	8717
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	46638	44307	53634	48970	48970	0	0	0	0	0	0	0	242520
Concrete Pump Truck	4103	0	4718	0	0	0	0	0	0	0	0	0	8821
Concrete Mixer Truck	6408	6088	7369	0	0	0	0	0	0	0	0	0	19865
On-Site Truck Deliveries	15	7	17	0	0	0	0	0	0	0	0	0	39
On-Road Truck Deliveries	995	472	1144	0	0	0	0	0	0	0	0	0	2611
Worker Vehicles	752	712	1022	153	151	158	0	0	0	0	0	0	2949

TOTAL PM2.5 EMISSIONS FOR 2022	**386523**	**g/year**
	0.426	**tons/year**

2022 HOBOKEN PM2.5 EMISSIONS WORKSHEET; Alternative 3, Option 2

2022

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	15745	14958	36214	33065	33065	34639	31490	0	0	0	0	0	199175
Crane	0	0	1807	0	0	0	0	0	0	0	0	0	1807
Backhoe	2388	1134	1373	1254	1254	1313	0	0	0	0	0	0	8717
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	46638	44307	53634	48970	48970	0	0	0	0	0	0	0	242520
Concrete Pump Truck	4103	0	4718	0	0	0	0	0	0	0	0	0	8821
Concrete Mixer Truck	6408	6088	7369	0	0	0	0	0	0	0	0	0	19865
On-Site Truck Deliveries	15	7	17	0	0	0	0	0	0	0	0	0	39
On-Road Truck Deliveries	995	472	1144	0	0	0	0	0	0	0	0	0	2611
Worker Vehicles	752	712	1022	153	151	158	0	0	0	0	0	0	2949

TOTAL PM2.5 EMISSIONS FOR 2022	**486505**	**g/year**
	0.536	**tons/year**

2022 AIR EMISSION WORKSHEETS

2022 HOBOKEN VOC EMISSIONS WORKSHEET; Alternative 1, Option 1

2022

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	55725	52938	64083	58511	58511	30649	55725	0	0	0	0	0	376142
Crane	0	0	0	0	0	0	4274	0	0	0	0	0	4274
Backhoe	4525	4299	5204	4752	4752	3319	4525	0	0	0	0	0	31376
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	75562	71784	86896	79340	79340	0	0	0	0	0	0	0	392922
Concrete Pump Truck	7256	6893	8345	7619	7619	7982	7256	0	0	0	0	0	52970
Concrete Mixer Truck	5217	4956	6000	5478	5478	5739	5217	0	0	0	0	0	38087
On-Site Truck Deliveries	31	29	35	32	32	17	15	0	0	0	0	0	191
On-Road Truck Deliveries	1973	1874	2269	2072	2076	1092	995	0	0	0	0	0	12350
Worker Vehicles	2187	2084	2617	2817	2938	1406	2622	0	0	0	0	0	16671

TOTAL VOC EMISSIONS FOR 2022	**924983**	**g/year**
	1.019	**tons/year**

2022 HOBOKEN VOC EMISSIONS WORKSHEET; Alternative 1, Option 2

2022

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	55725	52938	64083	58511	58511	30649	55725	0	0	0	0	0	376142
Crane	0	0	0	0	0	0	4274	0	0	0	0	0	4274
Backhoe	4525	4299	5204	4752	4752	3319	3017	0	0	0	0	0	29868
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	75562	71784	86896	79340	79340	0	0	0	0	0	0	0	392922
Concrete Pump Truck	7256	6893	8345	7619	7619	7982	7256	0	0	0	0	0	52970
Concrete Mixer Truck	5217	4956	6000	5478	5478	5739	5217	0	0	0	0	0	38087
On-Site Truck Deliveries	31	29	35	32	32	17	15	0	0	0	0	0	191
On-Road Truck Deliveries	1973	1874	2269	2072	2076	1092	995	0	0	0	0	0	12350
Worker Vehicles	2187	2084	2617	2817	2938	1406	2622	0	0	0	0	0	16671

TOTAL VOC EMISSIONS FOR 2022	**923475**	**g/year**
	1.018	**tons/year**

2022 AIR EMISSION WORKSHEETS

2022 HOBOKEN VOC EMISSIONS WORKSHEET; Alternative 2, Option 1

2022

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	27862	26469	64083	58511	58511	61297	55725	0	0	0	0	0	352459
Crane	0	0	0	0	4488	0	0	0	0	0	0	0	4488
Backhoe	3017	2866	3470	3168	3168	3319	1508	0	0	0	0	0	20515
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	75562	71784	86896	79340	79340	0	0	0	0	0	0	0	392922
Concrete Pump Truck	7256	6893	8345	7619	7619	0	0	0	0	0	0	0	37732
Concrete Mixer Truck	5217	4956	6000	5478	5478	5739	5217	0	0	0	0	0	38087
On-Site Truck Deliveries	23	22	26	24	24	8	8	0	0	0	0	0	135
On-Road Truck Deliveries	1480	1406	1702	1554	1557	546	497	0	0	0	0	0	8741
Worker Vehicles	1458	1389	1745	2415	2938	469	437	0	0	0	0	0	10851

TOTAL VOC EMISSIONS FOR 2022	**865929**	**g/year**
	0.954	**tons/year**

2022 HOBOKEN VOC EMISSIONS WORKSHEET; Alternative 2, Option 2

2022

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	27862	26469	64083	58511	58511	61297	55725	0	0	0	0	0	352459
Crane	0	0	0	0	4488	0	0	0	0	0	0	0	4488
Backhoe	3017	2866	3470	3168	3168	3319	1508	0	0	0	0	0	20515
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	75562	71784	86896	79340	79340	0	0	0	0	0	0	0	392922
Concrete Pump Truck	7256	6893	8345	7619	7619	0	0	0	0	0	0	0	37732
Concrete Mixer Truck	15652	14869	18000	16435	16435	11478	10435	0	0	0	0	0	103303
On-Site Truck Deliveries	38	36	44	48	48	17	15	0	0	0	0	0	247
On-Road Truck Deliveries	2466	2343	2836	3107	3113	1092	995	0	0	0	0	0	15953
Worker Vehicles	1458	1389	1745	2415	2938	469	437	0	0	0	0	0	10851

TOTAL VOC EMISSIONS FOR 2022	**938469**	**g/year**
	1.034	**tons/year**

2022 AIR EMISSION WORKSHEETS

2022 HOBOKEN VOC EMISSIONS WORKSHEET; Alternative 3, Option 1

2022

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	27862	26469	32042	29256	29255	30649	0	0	0	0	0	0	175533
Crane	0	0	4915	0	0	0	0	0	0	0	0	0	4915
Backhoe	3017	1433	1735	1584	1584	1659	0	0	0	0	0	0	11012
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	75562	71784	86896	79340	79340	0	0	0	0	0	0	0	392922
Concrete Pump Truck	7256	0	8345	0	0	0	0	0	0	0	0	0	15601
Concrete Mixer Truck	10435	9913	12000	0	0	0	0	0	0	0	0	0	32347
On-Site Truck Deliveries	31	14	35	0	0	0	0	0	0	0	0	0	80
On-Road Truck Deliveries	1973	937	2269	0	0	0	0	0	0	0	0	0	5179
Worker Vehicles	1823	1736	2617	402	420	469	0	0	0	0	0	0	7467

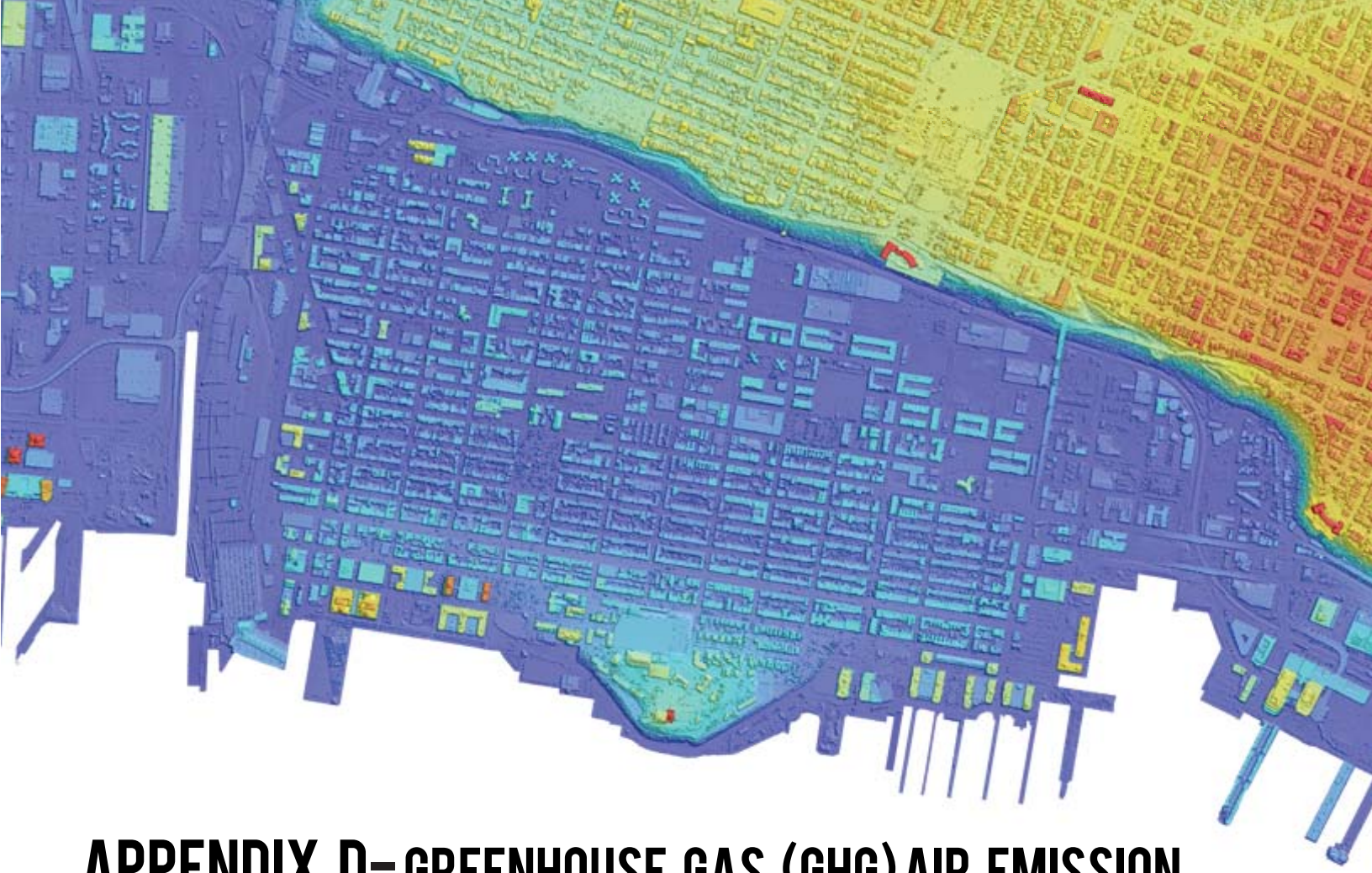
TOTAL VOC EMISSIONS FOR 2022	**645056**	**g/year**
	0.711	**tons/year**

2022 HOBOKEN VOC EMISSIONS WORKSHEET; Alternative 3, Option 2

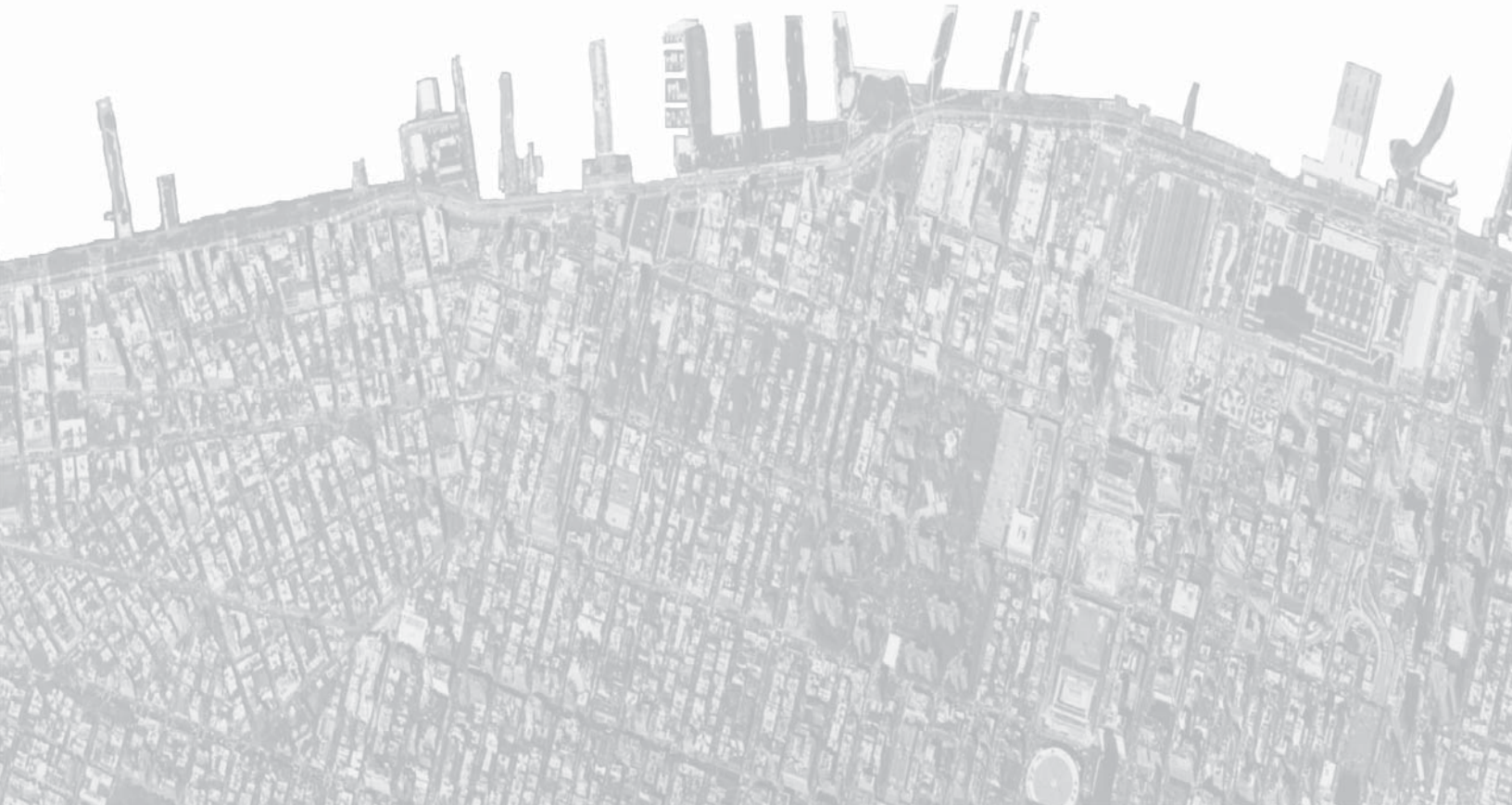
2022

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	27862	26469	64083	58511	58511	61297	55725	0	0	0	0	0	352459
Crane	0	0	4915	0	0	0	0	0	0	0	0	0	4915
Backhoe	3017	1433	1735	1584	1584	1659	0	0	0	0	0	0	11012
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	75562	71784	86896	79340	79340	0	0	0	0	0	0	0	392922
Concrete Pump Truck	7256	0	8345	0	0	0	0	0	0	0	0	0	15601
Concrete Mixer Truck	10435	9913	12000	0	0	0	0	0	0	0	0	0	32347
On-Site Truck Deliveries	31	14	35	0	0	0	0	0	0	0	0	0	80
On-Road Truck Deliveries	1973	937	2269	0	0	0	0	0	0	0	0	0	5179
Worker Vehicles	1823	1736	2617	402	420	469	0	0	0	0	0	0	7467

TOTAL VOC EMISSIONS FOR 2022	**821982**	**g/year**
	0.906	**tons/year**



APPENDIX D- GREENHOUSE GAS (GHG) AIR EMISSION WORKSHEETS



Rebuild By Design: Resist, Delay, Store, Discharge Project

Air Quality Technical Environmental Study – Key Inputs

Construction-Related Air Quality Assessment

2019 NONROAD							
Equipment	Model	Usage Factor	Peak HP	Emission Factors (grams/brake-horsepower-hour)[2]			
				CH_4	CO_2	N_2O[3]	$CO2e$[4]
Excavator	Kamatsu PC750C-7	0.59	474	0.05487	595.73167	0.01517	601.62417
Crane	LinkBelt 218 HYLAB	0.43	266	0.01568	589.91066	0.01502	594.77927
Backhoe	CAT416C	0.21	84	0.04577	695.26992	0.01771	701.69021
Bore Rig[1]	ABI Piling Rig	0.43	345	0.05231	589.65483	0.01502	595.43723
Dump Trucks	DT-12CY	0.59	350	0.05522	693.52229	0.01766	700.16557
Concrete Pump Truck	Pump Truck	0.20	350	0.05090	589.55020	0.01501	595.29654
Concrete Mixer Truck	Concrete Mixer 10.5 CY	1.00	350	0.04199	589.11488	0.01500	594.63513

2019 VEHICLES TRAVELING WITHIN AND TO/FROM WORKSITE				
Equipment	MOVES2014a Source Type	Speed (mph)	Miles	Emission Factor (g/veh-mi)[5]
				$CO2e$[4]
On-Site Truck Deliveries	52	2.5 <= Speed < 7.5 (SpeedBin 2)	0.5	3616.11-4134.69
On-Road Truck Deliveries	52	27.5 <= Speed < 32.5 (SpeedBin 7)	150.0	1192.9-1325.78
Worker Vehicles	30	27.5 <= Speed < 32.5 (SpeedBin 7)	150.0	399.066-437.79

[1] *Emission Factor averaged over year.*

[2] *MOVES run performed for all months in the year. Value shown is representative of the Emission Factor for the selected pollutant.*

[3] *Calculated based on a USEPA default diesel fuel emission factor of CO_2 (10.21 kg CO_2/gallon) to estimate fuel consumption, an N_2O emission factor developed by USEPA for non-road diesel construction equipment (0.26 g/gallon), and Global Warming Potential (GWP).*

[4] *Calculated using CH_4, CO_2, and N_2O Emission Factors scaled by appropriate Global Warming Potential (GWP) factors (assumed GWP for CH_4 is 25; CO_2 is 1; and N_2O is 298).*

[5] *Range of minimum and maximum Emission Factor.*

Rebuild By Design: Resist, Delay, Store, Discharge Project

Air Quality Technical Environmental Study – Key Inputs

Construction-Related Air Quality Assessment

2020 NONROAD							
Equipment	Model	Usage Factor	Peak HP	Emission Factors (grams/brake-horsepower-hour)[2]			
				CH_4	CO_2	N_2O[3]	CO2e[4]
Excavator	Kamatsu PC750C-7	0.59	474	0.05487	595.73607	0.01517	601.62860
Crane	LinkBelt 218 HYLAB	0.43	266	0.01567	589.92575	0.01502	594.79426
Backhoe	CAT416C	0.21	84	0.04541	695.34414	0.01771	701.75620
Bore Rig[1]	ABI Piling Rig	0.43	345	0.05284	589.70953	0.01502	595.50560
Dump Trucks	DT-12CY	0.59	350	0.05605	693.71439	0.01767	700.37995
Concrete Pump Truck	Pump Truck	0.20	350	0.05171	589.61505	0.01501	595.38214
Concrete Mixer Truck	Concrete Mixer 10.5 CY	1.00	350	0.04356	589.19608	0.01500	594.75640

2020 VEHICLES TRAVELING WITHIN AND TO/FROM WORKSITE				
Equipment	MOVES2014a Source Type	Speed (mph)	Miles	Emission Factor (g/veh-mi)[5]
				CO2e[4]
On-Site Truck Deliveries	52	2.5 <= Speed < 7.5 (SpeedBin 2)	0.5	3586.79-4101.21
On-Road Truck Deliveries	52	27.5 <= Speed < 32.5 (SpeedBin 7)	150.0	1183.04-1314.84
Worker Vehicles	30	27.5 <= Speed < 32.5 (SpeedBin 7)	150.0	386.796-424.343

[1] *Emission Factor averaged over year.*

[2] *MOVES run performed for all months in the year. Value shown is representative of the Emission Factor for the selected pollutant.*

[3] *Calculated based on a USEPA default diesel fuel emission factor of CO_2 (10.21 kg CO_2/gallon) to estimate fuel consumption, an N_2O emission factor developed by USEPA for non-road diesel construction equipment (0.26 g/gallon), and Global Warming Potential (GWP).*

[4] *Calculated using CH_4, CO_2, and N_2O Emission Factors scaled by appropriate Global Warming Potential (GWP) factors (assumed GWP for CH_4 is 25; CO_2 is 1; and N_2O is 298).*

[5] *Range of minimum and maximum Emission Factor.*

Rebuild By Design: Resist, Delay, Store, Discharge Project

Air Quality Technical Environmental Study – Key Inputs

Construction-Related Air Quality Assessment

2021 NONROAD							
Equipment	Model	Usage Factor	Peak HP	Emission Factors (grams/brake-horsepower-hour)[2]			
				CH_4	CO_2	N_2O[3]	CO2e[4]
Excavator	Kamatsu PC750C-7	0.59	474	0.05487	595.73620	0.01517	601.62874
Crane	LinkBelt 218 HYLAB	0.43	266	0.01580	589.93640	0.01502	594.80818
Backhoe	CAT416C	0.21	84	0.04515	695.40490	0.01771	701.81073
Bore Rig[1]	ABI Piling Rig	0.43	345	0.05329	589.75988	0.01502	595.56768
Dump Trucks	DT-12CY	0.59	350	0.05677	693.89940	0.01767	700.58446
Concrete Pump Truck	Pump Truck	0.20	350	0.05228	589.67390	0.01502	595.45578
Concrete Mixer Truck	Concrete Mixer 10.5 CY	1.00	350	0.04506	589.27380	0.01501	594.87205

2021 VEHICLES TRAVELING WITHIN AND TO/FROM WORKSITE				
Equipment	MOVES2014a Source Type	Speed (mph)	Miles	Emission Factor (g/veh-mi)[5]
				CO2e[4]
On-Site Truck Deliveries	52	2.5 <= Speed < 7.5 (SpeedBin 2)	0.5	3558.75-4069.21
On-Road Truck Deliveries	52	27.5 <= Speed < 32.5 (SpeedBin 7)	150.0	1173.62-1304.39
Worker Vehicles	30	27.5 <= Speed < 32.5 (SpeedBin 7)	150.0	374.091-410.412

[1] *Emission Factor averaged over year.*

[2] *MOVES run performed for all months in the year. Value shown is representative of the Emission Factor for the selected pollutant.*

[3] *Calculated based on a USEPA default diesel fuel emission factor of CO_2 (10.21 kg CO_2/gallon) to estimate fuel consumption, an N_2O emission factor developed by USEPA for non-road diesel construction equipment (0.26 g/gallon), and Global Warming Potential (GWP).*

[4] *Calculated using CH_4, CO_2, and N_2O Emission Factors scaled by appropriate Global Warming Potential (GWP) factors (assumed GWP for CH_4 is 25; CO_2 is 1; and N_2O is 298).*

[5] *Range of minimum and maximum Emission Factor.*

Rebuild By Design: Resist, Delay, Store, Discharge Project

Air Quality Technical Environmental Study – Key Inputs

Construction-Related Air Quality Assessment

2022 NONROAD							
Equipment	Model	Usage Factor	Peak HP	Emission Factors (grams/brake-horsepower-hour)[2]			
				CH_4	CO_2	N_2O[3]	CO2e[4]
Excavator	Kamatsu PC750C-7	0.59	474	0.05487	595.73628	0.01517	601.62883
Crane	LinkBelt 218 HYLAB	0.43	266	0.01589	589.94306	0.01502	594.81707
Backhoe	CAT416C	0.21	84	0.04490	695.45678	0.01771	701.85676
Bore Rig[1]	ABI Piling Rig	0.43	345	0.05366	589.80288	0.01502	595.62024
Dump Trucks	DT-12CY	0.59	350	0.05729	694.09566	0.01768	700.79502
Concrete Pump Truck	Pump Truck	0.20	350	0.05274	589.72357	0.01502	595.51733
Concrete Mixer Truck	Concrete Mixer 10.5 CY	1.00	350	0.04642	589.34706	0.01501	594.97991

2022 VEHICLES TRAVELING WITHIN AND TO/FROM WORKSITE				
Equipment	MOVES2014a Source Type	Speed (mph)	Miles	Emission Factor (g/veh-mi)[5]
				CO2e[4]
On-Site Truck Deliveries	52	2.5 <= Speed < 7.5 (SpeedBin 2)	0.5	3532.29-4039.05
On-Road Truck Deliveries	52	27.5 <= Speed < 32.5 (SpeedBin 7)	150.0	1164.74-1294.54
Worker Vehicles	30	27.5 <= Speed < 32.5 (SpeedBin 7)	150.0	361.393-396.487

[1] *Emission Factor averaged over year.*

[2] *MOVES run performed for all months in the year. Value shown is representative of the Emission Factor for the selected pollutant.*

[3] *Calculated based on a USEPA default diesel fuel emission factor of CO_2 (10.21 kg CO_2/gallon) to estimate fuel consumption, an N_2O emission factor developed by USEPA for non-road diesel construction equipment (0.26 g/gallon), and Global Warming Potential (GWP).*

[4] *Calculated using CH_4, CO_2, and N_2O Emission Factors scaled by appropriate Global Warming Potential (GWP) factors (assumed GWP for CH_4 is 25; CO_2 is 1; and N_2O is 298).*

[5] *Range of minimum and maximum Emission Factor.*

Rebuild By Design: Resist, Delay, Store, Discharge Project

Air Quality Technical Environmental Study – Key Inputs

Construction-Related Air Quality Assessment

2019-2022 Vehicle Fleet Age[1]		
SourceTypeID	AgeID	AgeFraction
31	0	0.06247132
31	1	0.08319917
31	2	0.08279160
31	3	0.08180565
31	4	0.08005042
31	5	0.07738674
31	6	0.07373784
31	7	0.06909993
31	8	0.06354860
31	9	0.05723773
31	10	0.05038930
31	11	0.04327397
31	12	0.03618420
31	13	0.03309787
31	14	0.02521575
31	15	0.01921073
31	16	0.01463578
31	17	0.01115033
31	18	0.00849493
31	19	0.00647190
31	20	0.00493064
31	21	0.00375643
31	22	0.00286185
31	23	0.00218031
31	24	0.00166108
31	25	0.00126550
31	26	0.00096413
31	27	0.00073453
31	28	0.00055960
31	29	0.00042634
31	30	0.00120584

2019-2022 Vehicle Fleet Age[1]		
SourceTypeID	AgeID	AgeFraction
52	0	0.05189965
52	1	0.05189965
52	2	0.05189957
52	3	0.05189867
52	4	0.05189405
52	5	0.05187796
52	6	0.05183406
52	7	0.05173258
52	8	0.05152456
52	9	0.05113567
52	10	0.05046074
52	11	0.04936100
52	12	0.04766761
52	13	0.04519662
52	14	0.04376973
52	15	0.03737277
52	16	0.03191073
52	17	0.02724697
52	18	0.02326482
52	19	0.01986466
52	20	0.01696144
52	21	0.01448252
52	22	0.01236590
52	23	0.01055862
52	24	0.00901547
52	25	0.00769786
52	26	0.00657282
52	27	0.00561220
52	28	0.00479197
52	29	0.00409163
52	30	0.01413752

[1] - Vehicle fleet age for vehicle source type 31 (passenger trucks) and 52 (single-unit short-haul trucks) provided by NJDEP

Rebuild By Design: Resist, Delay, Store, Discharge Project

Air Quality Technical Environmental Study – Key Inputs

Operational Air Quality Assessment

2022 GENERATORS							
Equipment	Model	Usage Factor	Peak HP	Emission Factors (grams/brake-horsepower-hour)[1]			
				CH_4	CO_2	N_2O[2]	$CO2e$[3]
Generator (60 kW)	Generac SD060	1.00	93	0.01545	589.36181	0.01501	594.22044
Generators (175 kW)	Generac SD175	1.00	267	0.01362	530.30940	0.01350	534.67411

[1] *MOVES run performed for all months in the year. Value shown is representative of the Emission Factor for the selected pollutant.*

[2] *Calculated based on a USEPA default diesel fuel emission factor of CO_2 (10.21 kg CO_2/gallon) to estimate fuel consumption, an N_2O emission factor developed by USEPA for non-road diesel construction equipment (0.26 g/gallon), and Global Warming Potential (GWP).*

[3] *Calculated using CH_4, CO_2, and N_2O Emission Factors scaled by appropriate Global Warming Potential (GWP) factors (assumed GWP for CH_4 is 25; CO_2 is 1; and N_2O is 298).*

2019 GHG EMISSION WORKSHEETS

2019 HOBOKEN CO2e EMISSIONS WORKSHEET; Alternative 1, Option 1

2019

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	56532068	51148006	56531982	59224020	59223981	53839997	59224004	59224004	53840069	59224056	51148065	56532068	675692320
Crane	0	0	0	0	0	0	0	0	10884936	0	0	0	10884936
Backhoe	12476799	11288532	12476784	13070931	13070916	11882650	13070956	13070956	11882681	6535486	5644274	6238399	130709365
Bore Rig	0	0	59359852	62186511	62186511	56533192	62186511	0	0	0	0	0	302452578
Dump Trucks	72870431	65930324	72870366	152680221	152680767	138800594	152680611	152680611	138800678	152680735	43953548	48580288	1345209175
Concrete Pump Truck	0	0	7000687	7334039	7334053	6667308	7334053	7334053	6667308	7334053	6333943	7000687	70340187
Concrete Mixer Truck	0	0	34964409	36629434	36629381	33299507	36629524	36629524	33299499	36629434	7908631	8741121	301360463
On-Site Truck Deliveries	75938	68706	417661	437549	452285	442263	500297	495706	387570	397772	137412	151877	3965036
On-Road Truck Deliveries	7515270	6799530	41333985	43302270	44434830	42785820	48125814	47772978	37782600	39365700	13599060	15030540	387848397
Worker Vehicles	54053490	48905538	75676403	84942901	86879197	83064132	93183602	74064648	64777298	45302880	34234563	37837443	782922095

TOTAL CO2e EMISSIONS FOR 2019	**4011384552**	**g/year**
	4011.385	**mt/year**

2019 HOBOKEN CO2e EMISSIONS WORKSHEET; Alternative 1, Option 2

2019

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	56532068	51148006	56531982	59224020	59223981	53839997	59224004	59224004	53840069	59224056	51148065	56532068	675692320
Crane	0	0	0	0	0	0	0	0	10884936	0	0	0	10884936
Backhoe	12476799	11288532	12476784	13070931	13070916	11882650	13070956	13070956	11882681	6535486	5644274	6238399	130709365
Bore Rig	0	0	59359852	62186511	62186511	56533192	62186511	0	0	0	0	0	302452578
Dump Trucks	72870431	65930324	72870366	152680221	152680767	138800594	152680611	152680611	138800678	152680735	43953548	48580288	1345209175
Concrete Pump Truck	0	0	7000687	7334039	7334053	6667308	7334053	7334053	6667308	7334053	6333943	7000687	70340187
Concrete Mixer Truck	0	0	34964409	36629434	36629381	33299507	36629524	36629524	33299499	36629434	7908631	8741121	301360463
On-Site Truck Deliveries	75938	68706	417661	437549	452285	442263	500297	495706	387570	397772	137412	151877	3965036
On-Road Truck Deliveries	7515270	6799530	41333985	43302270	44434830	42785820	48125814	47772978	37782600	39365700	13599060	15030540	387848397
Worker Vehicles	54053490	48905538	75676403	84942901	86879197	83064132	93183602	74064648	64777298	45302880	34234563	37837443	782922095

TOTAL CO2e EMISSIONS FOR 2019	**4011384552**	**g/year**
	4011.385	**mt/year**

2019 GHG EMISSION WORKSHEETS

2019 HOBOKEN CO2e EMISSIONS WORKSHEET; Alternative 2, Option 1

2019

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	56532068	51148006	56531982	59224020	59223981	53839997	59224004	59224004	53840069	59224056	51148065	56532068	675692320
Crane	0	0	0	0	0	0	0	0	10884936	0	0	0	10884936
Backhoe	6238399	5644266	6238392	13070931	13070916	11882650	13070956	13070956	11882681	13070973	3762849	4158933	115162903
Bore Rig	0	0	29679926	31093256	31093256	28266596	31093256	0	0	0	0	29679926	180906215
Dump Trucks	72870431	65930324	72870366	152680221	152680767	138800594	152680611	152680611	138800678	152680735	43953548	48580288	1345209175
Concrete Pump Truck	0	0	7000687	7334039	7334053	6667308	7334053	0	0	0	0	0	35670141
Concrete Mixer Truck	0	0	34964409	36629434	36629381	33299507	36629524	36629524	33299499	36629434	7908631	8741121	301360463
On-Site Truck Deliveries	75938	68706	379692	397772	411168	402057	454816	405577	348813	357995	103059	113907	3519501
On-Road Truck Deliveries	7515270	6799530	37576350	39365700	40395300	38896200	43750740	39086982	34004340	35429130	10199295	11272905	344291742
Worker Vehicles	37837443	34233877	48649116	50965741	57919465	55376088	62122401	49376432	43184866	33977160	24453259	37837443	535933290

TOTAL CO2e EMISSIONS FOR 2019	**3548630687**	**g/year**
	3548.631	**mt/year**

2019 HOBOKEN CO2e EMISSIONS WORKSHEET; Alternative 2, Option 2

2019

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	56532068	51148006	56531982	59224020	59223981	53839997	59224004	59224004	53840069	59224056	51148065	56532068	675692320
Crane	0	0	0	0	0	0	0	0	10884936	0	0	0	10884936
Backhoe	2079466	5644266	6238392	8713954	13070916	11882650	13070956	13070956	11882681	13070973	3762849	4158933	106646993
Bore Rig	0	0	29679926	31093256	31093256	28266596	31093256	31093256	0	0	0	29679926	211999471
Dump Trucks	24290144	65930324	72870366	101786814	152680767	138800594	152680611	152680611	138800678	152680735	43953548	48580288	1245735480
Concrete Pump Truck	0	0	7000687	7334039	7334053	6667308	7334053	0	0	0	0	0	35670141
Concrete Mixer Truck	0	0	17482205	18314717	18314691	16649754	18314762	13736071	12487312	13736038	7908631	8741121	145685300
On-Site Truck Deliveries	75938	68706	265784	278440	287818	281440	318371	225321	155028	159109	103059	113907	2332922
On-Road Truck Deliveries	7515270	6799530	26303445	27555990	28276710	27227340	30625518	21714990	15113040	15746280	10199295	11272905	228350313
Worker Vehicles	37837443	34233877	48649116	50965741	57919465	55376088	62122401	49376432	43184866	33977160	24453259	37837443	535933290

TOTAL CO2e EMISSIONS FOR 2019	**3198931167**	**g/year**
	3198.931	**mt/year**

2019 GHG EMISSION WORKSHEETS

2019 HOBOKEN CO2e EMISSIONS WORKSHEET; Alternative 3, Option 1

2019

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	28266034	25574003	28265991	29612010	29611991	26919998	29612002	29612002	26920034	29612028	25574033	28266034	337846160
Crane	0	0	0	0	0	0	0	0	10884936	0	0	0	10884936
Backhoe	2079466	7525688	8317856	10892443	8713944	7921767	8713971	8713971	7921787	8713982	3762849	4158933	87436657
Bore Rig	0	0	29679926	31093256	31093256	0	0	0	0	0	0	0	91866437
Dump Trucks	24290144	87907099	97160488	127233518	101787178	92533729	101787074	101787074	92533785	101787157	43953548	48580288	1021341081
Concrete Pump Truck	0	0	7000687	7334039	7334053	6667308	7334053	0	0	0	0	0	35670141
Concrete Mixer Truck	0	0	13111653	13736038	13736018	12487315	13736071	13736071	8324875	4578679	3954316	4370560	101771597
On-Site Truck Deliveries	0	34353	189846	198886	164467	201029	227408	135192	116271	79554	68706	75938	1491651
On-Road Truck Deliveries	0	3399765	18788175	19682850	16158120	19448100	21875370	13028994	11334780	7873140	6799530	7515270	145904094
Worker Vehicles	32432094	29343323	43243659	45302880	52127518	38763262	43485681	43204378	37786757	33977160	24453259	27026745	451146717

TOTAL CO2e EMISSIONS FOR 2019	**2285359472**	**g/year**
	2285.359	**mt/year**

2019 HOBOKEN CO2e EMISSIONS WORKSHEET; Alternative 3, Option 2

2019

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	28266034	25574003	28265991	29612010	29611991	53839997	59224004	59224004	53840069	59224056	51148065	56532068	534362291
Crane	0	0	0	0	0	0	0	0	10884936	0	0	0	10884936
Backhoe	2079466	7525688	8317856	10892443	8713944	7921767	8713971	8713971	7921787	8713982	3762849	4158933	87436657
Bore Rig	0	0	29679926	31093256	31093256	28266596	0	0	0	0	0	0	120133033
Dump Trucks	24290144	87907099	97160488	127233518	101787178	92533729	101787074	101787074	92533785	101787157	43953548	48580288	1021341081
Concrete Pump Truck	0	0	7000687	7334039	7334053	6667308	7334053	0	0	0	0	0	35670141
Concrete Mixer Truck	0	0	13111653	13736038	13736018	12487315	13736071	13736071	8324875	4578679	3954316	4370560	101771597
On-Site Truck Deliveries	0	34353	189846	198886	164467	201029	227408	135192	116271	79554	68706	75938	1491651
On-Road Truck Deliveries	0	3399765	18788175	19682850	16158120	19448100	21875370	13028994	11334780	7873140	6799530	7515270	145904094
Worker Vehicles	32432094	29343323	43243659	45302880	52127518	44300870	43485681	43204378	37786757	33977160	24453259	27026745	456684326

TOTAL CO2e EMISSIONS FOR 2019	**2515679808**	**g/year**
	2515.680	**mt/year**

2020 GHG EMISSION WORKSHEETS

2020 HOBOKEN CO2e EMISSIONS WORKSHEET; Alternative 1, Option 1

2020

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	56532480	51148346	59224435	59224511	53840395	59224445	59224497	56532474	56532445	56532488	51148403	59224502	678389421
Crane	0	0	0	0	0	0	11973721	0	0	11429471	0	0	23403192
Backhoe	6239006	5644792	6536070	13072160	11883764	13072129	13072100	12477914	12477927	12477934	11289553	6536101	124779451
Bore Rig	0	0	0	62193652	56539684	62193652	62193652	59366668	0	0	0	0	302487308
Dump Trucks	24297576	21983499	25454595	101818336	92562164	152727653	152727226	145785079	145785160	145785018	43966953	50909206	1103802465
Concrete Pump Truck	7001694	6334853	7335108	7335097	6668280	7335097	7335108	7001694	7001683	7001694	6334856	7335108	84020272
Concrete Mixer Truck	8742919	7910258	9159234	36636985	33306305	36636873	36636950	34971634	34971627	8742899	7910249	9159249	264785180
On-Site Truck Deliveries	150645	136298	157819	434002	407835	526417	541360	512010	484382	150645	136298	157819	3795529
On-Road Truck Deliveries	14906304	13486656	15616128	42944352	40061670	50919264	52067664	49336182	47212956	14906304	13486656	15616128	370560264
Worker Vehicles	31434911	28441110	43910104	87820207	86760563	100371943	90321408	85657970	60432223	57632011	47402953	32931811	753117214

TOTAL CO2e EMISSIONS FOR 2020	**3709140296**	**g/year**
	3709.140	**mt/year**

2020 HOBOKEN CO2e EMISSIONS WORKSHEET; Alternative 1, Option 2

2020

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	56532480	51148346	59224435	59224511	53840395	59224445	59224497	56532474	56532445	56532488	51148403	59224502	678389421
Crane	0	0	0	11973727	0	0	11973721	0	0	11429471	0	0	35376919
Backhoe	6239006	5644792	6536070	13072160	11883764	13072129	13072100	12477914	12477927	12477934	11289553	6536101	124779451
Bore Rig	0	0	0	62193652	56539684	62193652	62193652	59366668	0	0	0	0	302487308
Dump Trucks	24297576	21983499	25454595	101818336	92562164	152727653	152727226	145785079	145785160	145785018	43966953	50909206	1103802465
Concrete Pump Truck	7001694	6334853	7335108	7335097	6668280	7335097	7335108	7001694	7001683	7001694	6334856	7335108	84020272
Concrete Mixer Truck	8742919	7910258	9159234	36636985	33306305	36636873	36636950	34971634	34971627	8742899	7910249	9159249	264785180
On-Site Truck Deliveries	150645	136298	157819	434002	407835	526417	541360	512010	484382	150645	136298	157819	3795529
On-Road Truck Deliveries	14906304	13486656	15616128	42944352	40061670	50919264	52067664	49336182	47212956	14906304	13486656	15616128	370560264
Worker Vehicles	31434911	28441110	43910104	87820207	86760563	100371943	90321408	85657970	60432223	57632011	47402953	32931811	753117214

TOTAL CO2e EMISSIONS FOR 2020	**3721114024**	**g/year**
	3721.114	**mt/year**

2020 GHG EMISSION WORKSHEETS

2020 HOBOKEN CO2e EMISSIONS WORKSHEET; Alternative 2, Option 1

2020

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	56532480	51148346	59224435	59224511	53840395	59224445	59224497	56532474	56532445	56532488	51148403	59224502	678389421
Crane	0	0	0	0	0	0	11973721	0	0	11429471	0	0	23403192
Backhoe	2079669	1881597	2178690	8714773	7922509	13072129	13072100	12477914	12477927	12477934	3763184	4357401	94475829
Bore Rig	29683334	26856350	31096826	31096826	0	0	0	0	0	0	0	0	118733336
Dump Trucks	24297576	21983499	25454595	101818336	92562164	152727653	152727226	145785079	145785160	145785018	43966953	50909206	1103802465
Concrete Pump Truck	0	0	0	7335097	6668280	7335097	7335108	7001694	7001683	7001694	6334856	7335108	63348617
Concrete Mixer Truck	8742919	7910258	9159234	36636985	33306305	36636873	36636950	34971634	34971627	8742899	7910249	9159249	264785180
On-Site Truck Deliveries	112984	102224	118364	434002	407835	482549	496246	469342	444017	150645	136298	157819	3512325
On-Road Truck Deliveries	11179728	10114992	11712096	42944352	40061670	46675992	47728692	45224834	43278543	14906304	13486656	15616128	342929987
Worker Vehicles	41913215	33181295	38421341	60376392	45932063	53138088	54192845	51394782	49444546	47153464	37922362	38420447	551490838

TOTAL CO2e EMISSIONS FOR 2020	**3244871189**	**g/year**
	3244.871	**mt/year**

2020 HOBOKEN CO2e EMISSIONS WORKSHEET; Alternative 2, Option 2

2020

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	56532480	51148346	59224435	59224511	53840395	59224445	59224497	56532474	56532445	56532488	51148403	59224502	678389421
Crane	0	0	0	0	0	0	11973721	0	0	11429471	0	0	23403192
Backhoe	4159337	3763194	4357380	6536080	5941882	13072129	13072100	12477914	12477927	12477934	1881592	2178700	92396171
Bore Rig	29683334	26856350	31096826	31096826	28269842	0	0	0	0	0	0	0	147003178
Dump Trucks	48595151	43966998	50909190	76363752	69421623	152727653	152727226	145785079	145785160	145785018	21983476	25454603	1079504930
Concrete Pump Truck	0	0	0	7335097	6668280	7335097	7335108	7001694	7001683	7001694	6334856	7335108	63348617
Concrete Mixer Truck	8742919	7910258	9159234	27477739	24979729	27477655	27477712	26228725	26228720	26228696	23730747	27477746	263119879
On-Site Truck Deliveries	112984	102224	118364	355092	333683	394813	406020	384007	363286	301290	272596	315638	3459997
On-Road Truck Deliveries	11179728	10114992	11712096	35136288	32777730	38189448	39050748	37002137	35409717	29812608	26973312	31232256	338591060
Worker Vehicles	41913215	33181295	38421341	60376392	45932063	53138088	54192845	51394782	49444546	47153464	37922362	38420447	551490838

TOTAL CO2e EMISSIONS FOR 2020	**3240707283**	**g/year**
	3240.707	**mt/year**

2020 GHG EMISSION WORKSHEETS

2020 HOBOKEN CO2e EMISSIONS WORKSHEET; Alternative 3, Option 1

2020

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	28266240	25574173	29612217	29612255	26920198	29612223	29612248	28266237	28266223	28266244	25574201	29612251	339194711
Crane	0	0	0	0	0	0	11973721	0	0	11429471	0	0	23403192
Backhoe	2079669	1881597	2178690	4357387	3961255	8714753	8714734	8318609	8318618	8318623	1881592	2178700	60904227
Bore Rig	29683334	26856350	31096826	31096826	28269842	31096826	0	0	0	0	0	0	178100004
Dump Trucks	24297576	21983499	25454595	50909168	46281082	101818435	101818151	97190053	97190107	97190012	21983476	25454603	711570757
Concrete Pump Truck	7001694	0	7335108	7335097	0	7335097	0	7001694	0	7001694	0	7335108	50345491
Concrete Mixer Truck	4371460	3955129	9159234	13738869	12489865	18318437	18318475	17485817	17485813	17485798	15820498	13738873	162368266
On-Site Truck Deliveries	112984	68149	157819	197273	148304	263209	270680	298672	242191	263629	170373	197273	2390556
On-Road Truck Deliveries	11179728	6743328	15616128	19520160	14567880	25459632	26033832	28779440	23606478	26086032	16858320	19520160	233971118
Worker Vehicles	36674063	37921480	43910104	54887630	45932063	53138088	54192845	51394782	49444546	47153464	37922362	43909082	556480506

TOTAL CO2e EMISSIONS FOR 2020	**2318728826**	**g/year**
	2318.729	**mt/year**

2020 HOBOKEN CO2e EMISSIONS WORKSHEET; Alternative 3, Option 2

2020

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	56532480	51148346	59224435	59224511	53840395	59224445	59224497	56532474	56532445	56532488	51148403	59224502	678389421
Crane	0	0	0	0	0	0	11973721	0	0	11429471	0	0	23403192
Backhoe	6239006	5644792	6536070	6536080	3961255	8714753	8714734	8318609	8318618	8318623	1881592	2178700	75362831
Bore Rig	0	26856350	31096826	31096826	28269842	31096826	0	0	0	0	0	0	148416670
Dump Trucks	72892727	65950497	76363785	76363752	46281082	101818435	101818151	97190053	97190107	97190012	21983476	25454603	880496680
Concrete Pump Truck	7001694	0	7335108	7335097	0	7335097	0	7001694	0	7001694	0	7335108	50345491
Concrete Mixer Truck	4371460	3955129	9159234	18318493	16653153	22898046	18318475	17485817	17485813	17485798	15820498	13738873	175690786
On-Site Truck Deliveries	112984	68149	157819	236728	185380	307077	270680	298672	242191	263629	170373	197273	2510954
On-Road Truck Deliveries	11179728	6743328	15616128	23424192	18209850	29702904	26033832	28779440	23606478	26086032	16858320	19520160	245760392
Worker Vehicles	36674063	37921480	43910104	60376392	51035625	59042320	48171417	45684251	43950708	47153464	37922362	43909082	555751267

TOTAL CO2e EMISSIONS FOR 2020	**2836127685**	**g/year**
	2836.128	**mt/year**

2021 GHG EMISSION WORKSHEETS

2021 HOBOKEN CO2e EMISSIONS WORKSHEET; Alternative 1, Option 1

2021

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	51148325	51148402	61916456	59224427	53840396	59224526	56532445	59224466	56532464	53840360	53840441	56532359	673005067
Crane	0	0	0	11974012	0	0	11429737	0	0	0	10885454	0	34289204
Backhoe	5645253	5645243	6833695	6536595	9903906	10894323	10399130	10894326	10399095	9903912	7923120	8319321	103297919
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	21989942	21989923	53238661	101848166	138883464	152771744	145827574	152771744	145827553	138883583	92588923	97218690	1263839967
Concrete Pump Truck	6335625	6335650	7669441	7336014	6669079	7336014	7002533	7335987	7002559	6669079	6669104	7002533	83363616
Concrete Mixer Truck	7911776	7911781	9577440	9161011	8328209	9161019	8744597	9161006	8744619	8328186	8328209	4372297	99730149
On-Site Truck Deliveries	135233	135233	204628	195731	183931	217628	213634	221752	200250	177938	177938	149468	2213362
On-Road Truck Deliveries	13379268	13379268	20244945	19364730	18064950	21047565	20544143	21364530	19515510	17604300	17604300	14787612	216901121
Worker Vehicles	27506911	27506911	33298552	37159254	44423459	51393314	55590305	57860576	53134326	48258771	38607017	35469438	510208835

TOTAL CO2e EMISSIONS FOR 2021	**2986849238**	**g/year**
	2986.849	**mt/year**

2021 HOBOKEN CO2e EMISSIONS WORKSHEET; Alternative 1, Option 2

2021

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	51148325	51148402	61916456	59224427	53840396	59224526	56532445	59224466	56532464	53840360	53840441	56532359	673005067
Crane	0	0	0	11974012	0	0	11429737	0	0	0	10885454	0	34289204
Backhoe	5645253	5645243	6833695	6536595	9903906	10894323	10399130	10894326	10399095	9903912	7923120	8319321	103297919
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	21989942	21989923	53238661	101848166	138883464	152771744	145827574	152771744	145827553	138883583	92588923	97218690	1263839967
Concrete Pump Truck	6335625	6335650	7669441	7336014	6669079	7336014	7002533	7335987	7002559	6669079	6669104	7002533	83363616
Concrete Mixer Truck	7911776	7911781	9577440	9161011	8328209	9161019	8744597	9161006	8744619	8328186	8328209	4372297	99730149
On-Site Truck Deliveries	135233	135233	204628	195731	183931	217628	213634	221752	200250	177938	177938	149468	2213362
On-Road Truck Deliveries	13379268	13379268	20244945	19364730	18064950	21047565	20544143	21364530	19515510	17604300	17604300	14787612	216901121
Worker Vehicles	27506911	27506911	33298552	37159254	44423459	51393314	55590305	57860576	53134326	48258771	38607017	35469438	510208835

TOTAL CO2e EMISSIONS FOR 2021	**2986849238**	**g/year**
	2986.849	**mt/year**

2021 GHG EMISSION WORKSHEETS

2021 HOBOKEN CO2e EMISSIONS WORKSHEET; Alternative 2, Option 1

2021

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	51148325	51148402	61916456	59224427	53840396	59224526	56532445	59224466	56532464	53840360	53840441	56532359	673005067
Crane	0	0	0	0	0	0	11429737	0	0	0	0	0	11429737
Backhoe	1881751	1881748	4555797	8715460	11884687	13073188	12478956	13073192	12478914	11884694	7923120	8319321	108150827
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	21989942	21989923	53238661	101848166	138883464	152771744	145827574	152771744	145827553	138883583	92588923	97218690	1263839967
Concrete Pump Truck	6335625	6335650	7669441	0	0	0	7002533	7335987	7002559	6669079	6669104	7002533	62022509
Concrete Mixer Truck	7911776	7911781	9577440	9161011	8328209	9161019	8744597	9161006	8744619	8328186	8328209	4372297	99730149
On-Site Truck Deliveries	135233	135233	163703	117439	110359	130577	170907	177402	160200	142350	142350	112101	1697851
On-Road Truck Deliveries	13379268	13379268	16195956	11618838	10838970	12628539	16435314	17091624	15612408	14083440	14083440	11090709	166437774
Worker Vehicles	22922426	22922426	27748793	37159254	39487519	45682945	50031275	46288461	42507461	38607017	33781140	25335313	432474030

TOTAL CO2e EMISSIONS FOR 2021	**2818787910**	**g/year**
	2818.788	**mt/year**

2021 HOBOKEN CO2e EMISSIONS WORKSHEET; Alternative 2, Option 2

2021

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	51148325	51148402	61916456	59224427	53840396	59224526	56532445	59224466	56532464	53840360	53840441	56532359	673005067
Crane	0	0	0	0	0	0	11429737	0	0	0	0	0	11429737
Backhoe	1881751	1881748	2277898	2178865	11884687	13073188	12478956	13073192	12478914	11884694	3961560	4159660	91215113
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	21989942	21989923	26619331	25462042	138883464	152771744	145827574	152771744	145827553	138883583	46294461	48609345	1065930705
Concrete Pump Truck	6335625	6335650	7669441	0	0	0	7002533	7335987	7002559	6669079	6669104	7002533	62022509
Concrete Mixer Truck	7911776	7911781	9577440	9161011	8328209	9161019	17489194	18322013	17489238	16656372	16656417	17489188	156153656
On-Site Truck Deliveries	135233	135233	204628	156585	147145	174103	299087	310453	240300	213525	213525	224201	2454017
On-Road Truck Deliveries	13379268	13379268	20244945	15491784	14451960	16838052	28761800	29910342	23418612	21125160	21125160	22181418	240307769
Worker Vehicles	22922426	22922426	27748793	37159254	39487519	45682945	50031275	46288461	42507461	38607017	33781140	25335313	432474030

TOTAL CO2e EMISSIONS FOR 2021	**2734992603**	**g/year**
	2734.993	**mt/year**

2021 HOBOKEN CO2e EMISSIONS WORKSHEET; Alternative 3, Option 1

2021

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	25574163	25574201	30958228	29612213	26920198	29612263	28266222	29612233	28266232	26920180	26920221	28266180	336502533
Crane	0	0	0	0	0	0	11429737	0	0	0	0	0	11429737
Backhoe	1881751	1881748	2277898	8715460	7923125	8715459	8319304	8715461	8319276	7923129	5942340	6239490	76854441
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	21989942	21989923	26619331	101848166	92588976	101847829	97218383	101847829	97218369	92589056	69441692	72914018	898113512
Concrete Pump Truck	0	6335650	7669441	0	0	0	7002533	0	7002559	0	6669104	7002533	41681818
Concrete Mixer Truck	3955888	3955890	4788720	13741516	16656417	22902547	17489194	18322013	17489238	12492279	8328209	8744594	148866505
On-Site Truck Deliveries	67616	101424	122777	156585	183931	261154	299087	266103	280350	177938	177938	149468	2244369
On-Road Truck Deliveries	6689634	10034451	12146967	15491784	18064950	25257078	28761800	25637436	27321714	17604300	17604300	14787612	219402026
Worker Vehicles	27506911	27506911	33298552	42467718	44423459	51393314	55590305	52074519	47820893	43432894	33781140	25335313	484631930

TOTAL CO2e EMISSIONS FOR 2021	**2219726872**	**g/year**
	2219.727	**mt/year**

2021 HOBOKEN CO2e EMISSIONS WORKSHEET; Alternative 3, Option 2

2021

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	51148325	51148402	30958228	29612213	26920198	29612263	56532445	59224466	56532464	53840360	53840441	56532359	555902165
Crane	0	0	0	0	0	0	11429737	0	0	0	0	0	11429737
Backhoe	1881751	1881748	2277898	8715460	7923125	8715459	8319304	8715461	8319276	7923129	5942340	6239490	76854441
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	21989942	21989923	26619331	101848166	92588976	101847829	97218383	101847829	97218369	92589056	69441692	72914018	898113512
Concrete Pump Truck	0	6335650	7669441	0	0	0	7002533	0	7002559	0	6669104	7002533	41681818
Concrete Mixer Truck	3955888	3955890	4788720	13741516	16656417	22902547	17489194	18322013	17489238	12492279	8328209	8744594	148866505
On-Site Truck Deliveries	67616	101424	122777	156585	183931	261154	299087	266103	280350	177938	177938	149468	2244369
On-Road Truck Deliveries	6689634	10034451	12146967	15491784	18064950	25257078	28761800	25637436	27321714	17604300	17604300	14787612	219402026
Worker Vehicles	27506911	27506911	33298552	42467718	44423459	51393314	55590305	52074519	47820893	43432894	33781140	25335313	484631930

TOTAL CO2e EMISSIONS FOR 2021	**2439126504**	**g/year**
	2439.127	**mt/year**

2022 GHG EMISSION WORKSHEETS

2022 HOBOKEN CO2e EMISSIONS WORKSHEET; Alternative 1, Option 1

2022

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	53840480	51148461	61916484	56532433	56532442	29612196	53840396	0	0	0	0	0	363422893
Crane	0	0	0	0	0	0	10885604	0	0	0	0	0	10885604
Backhoe	5942736	5645591	6834172	6239900	6239896	4358009	5942739	0	0	0	0	0	41203043
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	46308494	43993060	53254675	48623873	48623834	0	0	0	0	0	0	0	240803937
Concrete Pump Truck	6669770	6336304	7670235	7003248	7003258	7336736	6669770	0	0	0	0	0	48689322
Concrete Mixer Truck	4164857	3956613	4789578	4373098	4373093	4581345	4164855	0	0	0	0	0	30403439
On-Site Truck Deliveries	141292	134227	162485	148356	153354	86406	80781	0	0	0	0	0	906901
On-Road Truck Deliveries	13976880	13278036	16073412	14675724	15059772	8355468	7767240	0	0	0	0	0	89186532
Worker Vehicles	27971818	26573227	32168214	34266141	35047796	16549811	30688094	0	0	0	0	0	203265101

TOTAL CO2e EMISSIONS FOR 2022	**1028766771**	**g/year**
	1028.767	**mt/year**

2022 HOBOKEN CO2e EMISSIONS WORKSHEET; Alternative 1, Option 2

2022

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	53840480	51148461	61916484	56532433	56532442	29612196	53840396	0	0	0	0	0	363422893
Crane	0	0	0	0	0	0	10885604	0	0	0	0	0	10885604
Backhoe	5942736	5645591	6834172	6239900	6239896	4358009	3961826	0	0	0	0	0	39222130
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	46308494	43993060	53254675	48623873	48623834	0	0	0	0	0	0	0	240803937
Concrete Pump Truck	6669770	6336304	7670235	7003248	7003258	7336736	6669770	0	0	0	0	0	48689322
Concrete Mixer Truck	4164857	3956613	4789578	4373098	4373093	4581345	4164855	0	0	0	0	0	30403439
On-Site Truck Deliveries	141292	134227	162485	148356	153354	86406	80781	0	0	0	0	0	906901
On-Road Truck Deliveries	13976880	13278036	16073412	14675724	15059772	8355468	7767240	0	0	0	0	0	89186532
Worker Vehicles	27971818	26573227	32168214	34266141	35047796	16549811	30688094	0	0	0	0	0	203265101

TOTAL CO2e EMISSIONS FOR 2022	**1026785858**	**g/year**
	1026.786	**mt/year**

2022 GHG EMISSION WORKSHEETS

2022 HOBOKEN CO2e EMISSIONS WORKSHEET; Alternative 2, Option 1

2022

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	26920240	25574231	61916484	56532433	56532442	59224391	53840396	0	0	0	0	0	340540617
Crane	0	0	0	0	11429889	0	0	0	0	0	0	0	11429889
Backhoe	3961824	3763727	4556114	4159933	4159930	4358009	1980913	0	0	0	0	0	26940452
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	46308494	43993060	53254675	48623873	48623834	0	0	0	0	0	0	0	240803937
Concrete Pump Truck	6669770	6336304	7670235	7003248	7003258	0	0	0	0	0	0	0	34682816
Concrete Mixer Truck	4164857	3956613	4789578	4373098	4373093	4581345	4164855	0	0	0	0	0	30403439
On-Site Truck Deliveries	105969	100670	121864	111267	115016	43203	40391	0	0	0	0	0	638379
On-Road Truck Deliveries	10482660	9958527	12055059	11006793	11294829	4177734	3883620	0	0	0	0	0	62859222
Worker Vehicles	18647879	17715485	21445476	29370978	35047796	5516604	5114682	0	0	0	0	0	132858900

TOTAL CO2e EMISSIONS FOR 2022	**881157651**	**g/year**
	881.158	**mt/year**

2022 HOBOKEN CO2e EMISSIONS WORKSHEET; Alternative 2, Option 2

2022

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	26920240	25574231	61916484	56532433	56532442	59224391	53840396	0	0	0	0	0	340540617
Crane	0	0	0	0	11429889	0	0	0	0	0	0	0	11429889
Backhoe	3961824	3763727	4556114	4159933	4159930	4358009	1980913	0	0	0	0	0	26940452
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	46308494	43993060	53254675	48623873	48623834	0	0	0	0	0	0	0	240803937
Concrete Pump Truck	6669770	6336304	7670235	7003248	7003258	0	0	0	0	0	0	0	34682816
Concrete Mixer Truck	12494570	11869839	14368733	13119295	13119278	9162691	8329710	0	0	0	0	0	82464117
On-Site Truck Deliveries	176615	167784	203107	222534	230031	86406	80781	0	0	0	0	0	1167257
On-Road Truck Deliveries	17471100	16597545	20091765	22013586	22589658	8355468	7767240	0	0	0	0	0	114886362
Worker Vehicles	18647879	17715485	21445476	29370978	35047796	5516604	5114682	0	0	0	0	0	132858900

TOTAL CO2e EMISSIONS FOR 2022	**985774347**	**g/year**
	985.774	**mt/year**

2022 GHG EMISSION WORKSHEETS

2022 HOBOKEN CO2e EMISSIONS WORKSHEET; Alternative 3, Option 1

2022

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	26920240	25574231	30958242	28266217	28266221	29612196	0	0	0	0	0	0	169597346
Crane	0	0	12518450	0	0	0	0	0	0	0	0	0	12518450
Backhoe	3961824	1881864	2278057	2079967	2079965	2179005	0	0	0	0	0	0	14460682
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	46308494	43993060	53254675	48623873	48623834	0	0	0	0	0	0	0	240803937
Concrete Pump Truck	6669770	0	7670235	0	0	0	0	0	0	0	0	0	14340005
Concrete Mixer Truck	8329714	7913226	9579155	0	0	0	0	0	0	0	0	0	25822095
On-Site Truck Deliveries	141292	67114	162485	0	0	0	0	0	0	0	0	0	370890
On-Road Truck Deliveries	13976880	6639018	16073412	0	0	0	0	0	0	0	0	0	36689310
Worker Vehicles	23309849	22144356	32168214	4895163	5006828	5516604	0	0	0	0	0	0	93041013

TOTAL CO2e EMISSIONS FOR 2022	**607643729**	**g/year**
	607.644	**mt/year**

2022 HOBOKEN CO2e EMISSIONS WORKSHEET; Alternative 3, Option 2

2022

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Excavator	26920240	25574231	61916484	56532433	56532442	59224391	53840396	0	0	0	0	0	340540617
Crane	0	0	12518450	0	0	0	0	0	0	0	0	0	12518450
Backhoe	3961824	1881864	2278057	2079967	2079965	2179005	0	0	0	0	0	0	14460682
Bore Rig	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Trucks	46308494	43993060	53254675	48623873	48623834	0	0	0	0	0	0	0	240803937
Concrete Pump Truck	6669770	0	7670235	0	0	0	0	0	0	0	0	0	14340005
Concrete Mixer Truck	8329714	7913226	9579155	0	0	0	0	0	0	0	0	0	25822095
On-Site Truck Deliveries	141292	67114	162485	0	0	0	0	0	0	0	0	0	370890
On-Road Truck Deliveries	13976880	6639018	16073412	0	0	0	0	0	0	0	0	0	36689310
Worker Vehicles	23309849	22144356	32168214	4895163	5006828	5516604	0	0	0	0	0	0	93041013

TOTAL CO2e EMISSIONS FOR 2022	**778587000**	**g/year**
	778.587	**mt/year**

2022 EMERGENCY GENERATOR GHG EMISSION WORKSHEET

2022 HOBOKEN CO2e EMISSIONS WORKSHEET; Generators

2022

	January	February	March	April	May	June	July	August	September	October	November	December	Total	
Generator (60 kW)	276312	221050	221050	221050	276312	221050	221050	276312	221050	276312	221050	221050	2873649	
Generators (175 kW)	1427578	1142064	1142062	1142063	1427578	1142063	1142062	1427578	1142063	1427578	1142063	1142062	14846814	
										TOTAL CO2e EMISSIONS FOR 2022			**17720463**	**g/year**
													17.720	**mt/year**

Alternative 1, Option 1				
Construction Activities				Operational[1]
2019	2020	2021	2022	2022
4,011	3,709	2,987	1,029	18

Alternative 1, Option 2				
Construction Activities				Operational[1]
2019	2020	2021	2022	2022
4,011	3,721	2,987	1,027	18

Alternative 2, Option 1				
Construction Activities				Operational[1]
2019	2020	2021	2022	2022
3,549	3,245	2,819	881	18

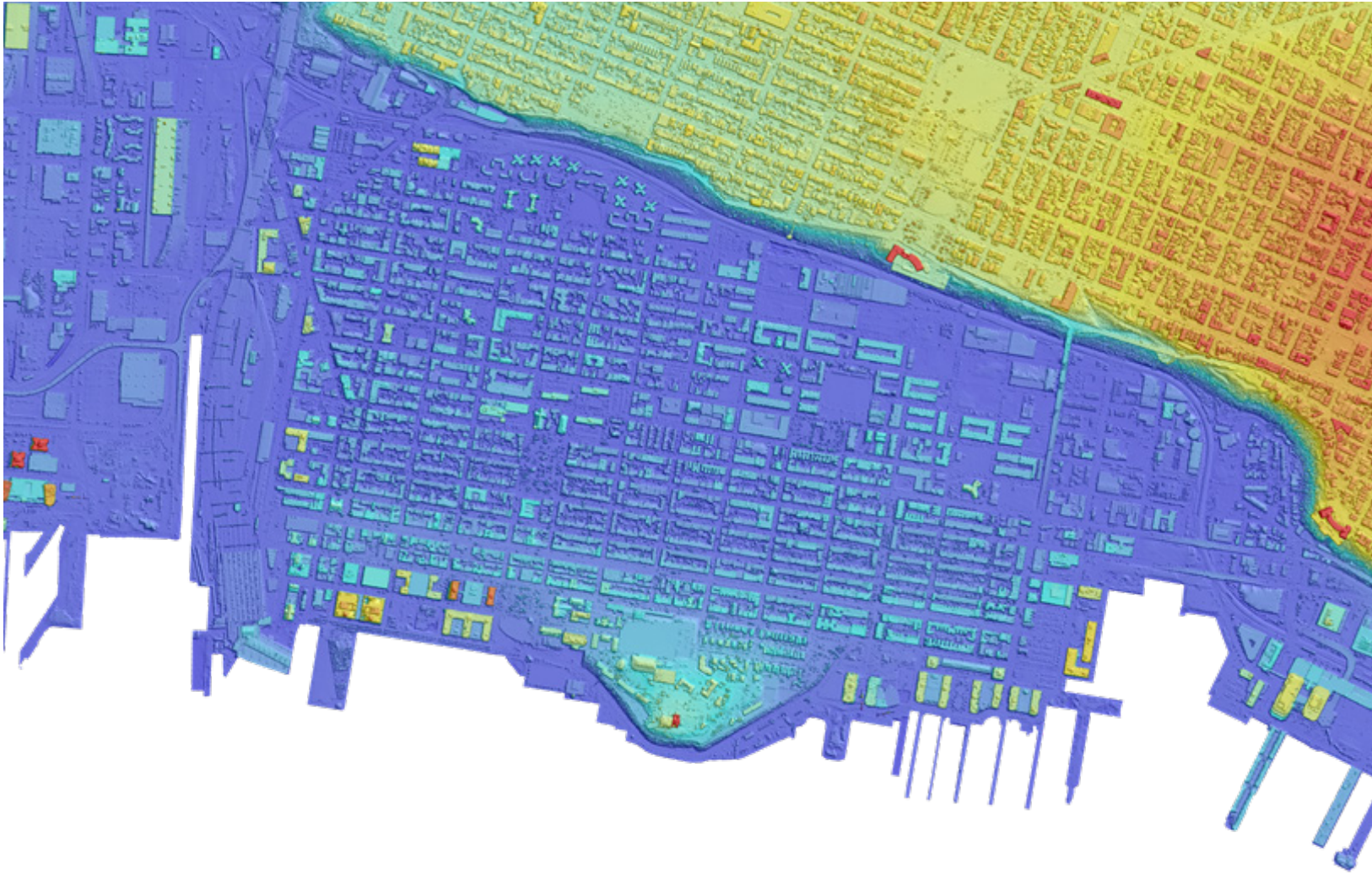
Alternative 2, Option 2				
Construction Activities				Operational[1]
2019	2020	2021	2022	2022
3,199	3,241	2,735	986	18

Alternative 3, Option 1				
Construction Activities				Operational[1]
2019	2020	2021	2022	2022
2,285	2,319	2,220	608	18

Alternative 3, Option 2				
Construction Activities				Operational[1]
2019	2020	2021	2022	2022
2,516	2,836	2,439	779	18

Note: All values are reported in metric tons of CO2 equivalent (mt CO2-e) and 2022 emission totals include operational generator testing emissions.

[1] - Yearly emissions due to weekly testing of emergency generators are expected to result in 18 mt CO2-e in perpetuity.



Dewberry

State of New Jersey
Department of Environmental Protection

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